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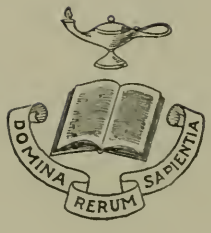


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# MEDICO-CHIRURGICAL TRANSACTIONS.

PUBLISHED BY THE

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MEDICAL AND CHIRURGICAL SOCIETY

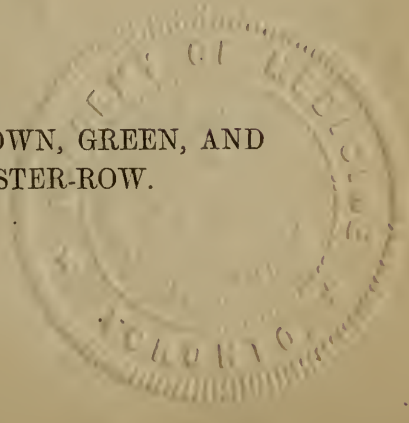
OF

LONDON.

VOLUME THE THIRTY-SECOND.

LONDON:
PRINTED FOR LONGMAN, BROWN, GREEN, AND LONGMANS, PATERNOSTER-ROW.

1849.



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PATERNOSTER-ROW.

1849.

# ROYAL
# MEDICAL AND CHIRURGICAL SOCIETY.
## OF LONDON.

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FOR THE SESSION OF 1848-9.

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1805. WILLIAM SAUNDERS, M.D.
1808. MATTHEW BAILLIE, M.D.
1810. SIR HENRY HALFORD, Bart., M.D., G.C.H.
1813. SIR GILBERT BLANE, Bart., M.D.
1815. HENRY CLINE.
1817. WILLIAM BABINGTON, M.D.
1819. SIR ASTLEY PASTON COOPER, Bart., K.C.H., D.C.L.
1821. JOHN COOKE, M.D.
1823. JOHN ABERNETHY.
1825. GEORGE BIRKBECK, M.D.
1827. BENJAMIN TRAVERS.
1829. PETER MARK ROGET, M.D.
1831. WILLIAM LAWRENCE.
1833. JOHN ELLIOTSON, M.D.
1835. HENRY EARLE.
1837. RICHARD BRIGHT, M.D.
1839. SIR BENJAMIN COLLINS BRODIE, Bart.
1841. ROBERT WILLIAMS, M.D.
1843. EDWARD STANLEY.
1845. WILLIAM F. CHAMBERS, M.D., K.C.H.
1847. JAMES MONCRIEFF ARNOTT.
1849. THOMAS ADDISON, M.D.

# FELLOWS

OF THE

# ROYAL

# MEDICAL AND CHIRURGICAL SOCIETY.

## OF LONDON.

EXPLANATION OF THE ABBREVIATIONS.

| | |
|---|---|
| P.—President. | V.P.—Vice-President. |
| T.—Treasurer. | S.—Secretary. |
| L.—Librarian | C.—Member of Council. |

## *AUGUST* 1849.

Amongst the non-residents, those marked thus (*) are entitled by composition to receive the Transactions.

ELECTED

1841 *James Abercrombie, M.D., *Cape of Good Hope.*

1846 *John Abercrombie, M.D., *Physician to the General Dispensary, Cheltenham; Cheltenham.*

1827 Elias Acosta, M.D., *Caraccas.*

1842 William Acton, *Surgeon to the Islington Dispensary;* 46, *Queen Anne-street, Cavendish-square.*

1818 Walter Adam, M.D., *Physician to the Royal Public Dispensary, Edinburgh.*

1818 Thomas Addison, M.D., PRESIDENT; *Physician to, and Lecturer on Medicine at, Guy's Hospital;* 24, *New-street, Spring-gardens.* C. 1826. V.P. 1837. P. 1849.

1814 Joseph Ager, M.D., *Great Portland-street.* C. 1836.

1819 *James Ainge, *Fareham, Hants.*

1837 *Ralph Fawsett Ainsworth, M.D., 104, *King-street, Manchester.*

1819 George F. Albert.

1839 Rutherford Alcock, K.C.T., K.T.S., *China.*

ELECTED

1826 James Alderson, M.D., F.R.S., TREASURER, 36, *Charles-street, Berkeley-square.* S. 1828. C. 1848. T. 1849.

1843 C. J. B. Aldis, M.D., *Physician to the London and Surrey Dispensaries, and Lecturer on Medicine at the Hunterian School of Medicine;* 1, *Chester-terrace, Chester-square.*

1813 Henry Alexander, F.R.S., *Surgeon-Oculist in Ordinary to the Queen, and Surgeon to the Royal Infirmary for Diseases of the Eye;* 6, *Cork-street.* C. 1840.

1836 Henry Ancell, 3, *Norfolk-crescent, Oxford-square.* C. 1847.

1817 Alexander Anderson.

1820 Thomas F. Andrews, M.D. *Norfolk, Virginia.*

1813 William Ankers, *Knutsford.*

1819 Professor Antommarchi, *Florence.*

1818. William Withering Arnold, M. D., *Physician to the Infirmary and Lunatic Asylum, Leicester.*

1825 Thomas Graham Arnold, M.D., *Stamford.*

1819 James M. Arnott, F.R.S., *Professor of Surgery at University College, and Surgeon to University College Hospital;* 2, *New Burlington-street.* L. 1826. T. 1825. V.P. 1832. C. 1846. P. 1847.

1817 John Ashburner, M.D., M.R.I.A., *Physician-Accoucheur to the Queen Charlotte's Lying-in-Hospital;* 65, *Grosvenor-street.* C. 1821.

1848 James Ramsey Atkins, M.D., F.L.S., *Grove House Lunatic Asylum, Stoke Newington-green.*

1841 John Avery, *Surgeon to the Charing-cross Hospital;* 3, *Queen-street, May-fair.*

1825 Benjamin Guy Babington, M.D., F.R.S., *Physician to Guy's Hospital, and Physician to the Deaf and Dumb Institution;* 31, *George-street, Hanover-square.* C. 1829. V.P. 1829. T. 1845.

1846 C. S. Metcalfe Babington, *Surgeon-Accoucheur to the St. George's and St. James's Dispensary, and Lecturer on Midwifery at the Middlesex Hospital;* 2, *Chester-street, Belgrave-square.*

1819 John Carr Badely, M.D., *Chelmsford.*

1820 *John H. Badley, *Dudley.*

1838 Francis Badgley, M.D., *Montreal, Upper Canada.*

1840 William Bainbridge, *Upper Tooting.*

ELECTED

1836 Andrew Wood Baird, M.D., *Ipswich.*

1816 *William Baker, M.D., *Physician to the Derbyshire General Infirmary; Derby.*

1839 T. Graham Balfour, M.D., *Royal Military Asylum, Chelsea.*

1848 Edward Ballard, M.D., 32, *Lower Parade, Leamington.*

1849 Thomas Ballard, 10, *Southwick-place, Hyde-park.*

1837 William Baly, M.D., F.R.S., SECRETARY; *Physician to the Milbank Prison, and Lecturer on Forensic Medicine at St. Bartholomew's Hospital;* 28, *Spring-gardens.* C. 1845. L. 1847. S. 1848.

1847 Andrew Whyte Barclay, M.D., *Physician to the Chelsea Dispensary;* 42, *Curzon-street, May-fair.*

1833 Thomas Alfred Barker, M.D., *Physician to, and Lecturer on Medicine at, St. Thomas's Hospital; Grosvenor-street.* C. 1844.

1848 Edgar Barker, 40, *Edgware Road.*

1843 Thomas Herbert Barker, *Priory-terrace, Bedford.*

1847 George Hilaro Barlow, M.D., *Physician to Guy's Hospital;* 5, *Union-street, Southwark.*

1849 William Frederick Barlow, *Resident Medical Officer, Westminster Hospital.*

1843 Christopher Hewetson Barnes, E.I.C.S., *Belle-Vue House, Notting-hill.*

1815 *John Baron, M.D., *Cheltenham.*

1840 Benjamin Barrow, *Ryde, Isle of Wight.*

1844 William R. Basham, M.D., *Physician to, and Lecturer on Materia Medica at, the Westminster Hospital; Chester-street, Grosvenor-place.*

1836 William Beaumont, *Professor of Surgery in the University of King's College; Toronto, Upper Canada.*

1841 George Beaman, 32, *King-street, Covent-garden.*

1840 Charles Beevor, *Surgeon to the St. Marylebone Dispensary;* 49, *Berners-street.*

1819 Thomas Bell, F.R.S., L.S., and G.S., *Lecturer on Diseases of the Teeth at Guy's Hospital;* 17, *New Broad-street.* C. 1832.

1847 Henry Bennet, M.D., *Physician-Accoucheur to the Western General Dispensary; Cambridge-square, Hyde-park.*

1845 Edwin Unwin Berry, *James-street, Covent-garden.*

ELECTED

1820 Stephen Bertin, *Paris.*

1827 William Birch, *Barton, Lichfield.*

1845 Golding Bird, M.D., F.R.S., *Assistant-Physician to, and Lecturer on Materia Medica at, Guy's Hospital; Myddelton-square.*

1835 James Bird, 16, *Orchard-street, Portman-square.*

1849 Edmund Lloyd Birkett, M.D., *Cloak-lane, Cheapside.*

1846 Hugh Birt, *Morro Velhio, Minus Quæes, Rio Janeiro, Brazil; Surgeon to the Morro Velhio Hospital.*

1843 Patrick Black, M.D., *Assistant-Physician to St. Bartholomew's Hospital, and Physician to the Seamen's Hospital Ship "Dreadnought;" Bedford-square.*

1844 Thomas Blackall, M.D., *Physician to the Pimlico Dispensary, and to the Seamen's Hospital Ship "Dreadnought;" Queen-street, May-fair.*

1847 George C. Blackman, M.D., *New York, U.S.*

1839 Richard Blagden, *Surgeon-Accoucheur, and Surgeon Extraordinary to the Queen; Surgeon in Ordinary to Her Royal Highness the Duchess of Kent; Albemarle-street.* C. 1847.

1814 Thomas Blair, M.D., *Physician to the Sussex County Hospital; Brighton.*

1840 Peyton Blakiston, M.D., F.R.S., *late Physician to the General Hospital, Birmingham; St. Leonard's-on-Sea.*

1845 Henry Blenkinsop, *Warwick.*

1811 *Henry C. Boisragon, M.D., *Cheltenham.*

1823 Louis Henry Bojanus, M.D., *Wilna.*

1816 Hugh Bone, M.D., *Inspector-General of Hospitals, Edinburgh.*

1810 John Booth, M.D., *Physician to the General Hospital at Birmingham.*

1846 John Ashton Bostock, *Scots Fusilier Guards.*

1846 Peter Bossey, *Thomas-street, Woolwich.*

1841 William Bowman, F.R.S., *Professor of Physiology and General Anatomy at King's College, and Assistant-Surgeon to King's College Hospital, and to the Royal Ophthalmic Hospital, Moorfields;* 14, *Golden-square.*

1849 Edward B. Bowman, M.D., 4, *Oxford-terrace, Middleton Road, Dalston.*

ELECTED

1844 Robert Brandon.

1814 Richard Bright, M.D., F.R.S., *Physician Extraordinary to the Queen, and Consulting Physician to Guy's Hospital; Saville-row.* C. 1821. V.P. 1827. P. 1837.

1813 Sir Benjamin Collins Brodie, Bart, F.R.S., *Serjeant-Surgeon to the Queen, Surgeon in Ordinary to His Royal Highness Prince Albert, Foreign Correspondent of the Institute of France, and Foreign Associate of the Royal Academy of Medicine of Paris; Saville-row.* C. 1814. V.P. 1816. P. 1839.

1844 Charles Brooke, F.R.S., *Keppel-street, Russell-square.*

1848 William Philpot Brookes, M.D., *Surgeon to the Cheltenham General Hospital and Dispensary, and Visiting Medical Officer to the Cheltenham District of Lunatic Asylums; Albion House, Cheltenham.*

1847 George Brown, *Grenadier Guards Hospital; Rochester-row, Westminster.*

1847 *Robert Brown, *Winckley-square, Preston, Lancashire.*

1842 Charles Blakely Brown, M.B., *Physician-Accoucheur to the Queen Charlotte's Lying-in Hospital, and St. George's and St. James's Dispensary;* 38, *Hill-street, Berkeley-square.*

1818 *Samuel Barwick Bruce, *Surgeon to the Forces; Ripon.*

M. Pierre Brulatour, *Surgeon to the Hospital; Bordeaux.*

1823 B. Bartlet Buchanan, M.D.

1843 J. Charles Bucknill, M.B., *Exminster, Devonshire.*

1839 George Budd, M.D., F.R.S., *Fellow of Caius College, Cambridge; Professor of Medicine in King's College, London; Physician to King's College Hospital;* 20, *Dover-street, Piccadilly.* C. 1846.

1839 Thomas Henry Burgess, M.D., 12, *Half Moon-street, Piccadilly.*

1833 George Burrows, M.D., F.R.S., VICE-PRESIDENT, *Physician to, and Lecturer on Medicine at, St. Bartholomew's Hospital;* 45, *Queen Anne-street.* C. 1839. T. 1845. V.P. 1849.

1820 Samuel Burrows.

1837 George Busk, *Surgeon to the Hospital-ship "Dreadnought;" Croom's Hill, Greenwich.* C. 1847.

ELECTED

1818 John Butter, M.D., F.R.S., F.L.S., *Physician to the Plymouth Eye Infirmary; Plymouth.*

1842 Henry Cantis, 8, *Maddox-street, Hanover-square.*

1846 John Burford Carlill, 57, *Berners-street.*

1839 Robert Carswell, M.D., *Physician to their Majesties the King and Queen of the Belgians; Brussels.*

1825 Harry Carter, M.D., *Physician to the Kent and Canterbury Hospital; Canterbury.*

1818 Richard Cartwright, 34, *Bloomsbury-square.*

1820 Samuel Cartwright, F.R.S., *Nizell's House, near Tonbridge.*

1845 Samuel Cartwright, jun., 9, *Saville-row.*

1839 William Cathrow, *Weymouth-street.*

1845 William Oliver Chalk, *Nottingham-terrace, New-road.*

1818 Richard Chamberlaine, *Kingston, Jamaica.*

1816 William Frederick Chambers, K.C.H., M.D., F.R.S., *Physician to the Queen, and to the Queen Dowager; Great Cumberland-street, Hyde Park.* C. 1818. V.P. 1821. P. 1845.

1844 Thomas King Chambers, M.D., 1, *Hill-street, Berkeley-square.*

1837 Henry T. Chapman, 16, *Lower Seymour-street, Portman-square.*

1849 Frederick Chapman, 17, *Richmond-green, Richmond, Surrey.*

1838 George Chaplin Child, M.D., *Physician to the Westminster General Dispensary;* 12, *Queen Anne-street, Cavendish-square.*

1849 Robert F. Chorley, M.D., *Physician to the St. Marylebone Dispensary;* 3, *South Molton-street.*

1842 W. D. Chowne, M.D., *Physician to the Charing-cross Hospital;* 8, *Connaught-place, West, Hyde-park.*

1827 Sir James Clark, Bart., M.D., F.R.S., *Physician to the Queen, Physician in Ordinary to His Royal Highness Prince Albert, and Consulting Physician to their Majesties the King and Queen of the Belgians; Brook-street.* C. 1830. V.P. 1832.

1839. Frederick Le Gros Clark, SECRETARY; *Assistant-Surgeon to, and Lecturer on Descriptive and Surgical Anatomy at, St. Thomas's Hospital; Consulting Surgeon to the Western General Dispensary;* 24, *Spring-gardens.* S. 1847.

ELECTED

1845 John Clark, M.D., *Staff Surgeon 2d class ; West Indies.*

1847 Benjamin Clark, *Brook-street, Grosvenor-square.*

1848 John Clarke, *Surgeon to the Brownlow-street Hospital ;* 3, *Clifford-street, Bond-street.*

1835 James Clayton, 3, *Percy-street, Bedford-square.*

1842 Oscar M. P. Clayton, 3, *Percy-street, Bedford-square.*

1835 *William Colborne, *Chippenham, Wilts.*

1818 Robert Cole, F.L.S., *Holybourne, Hampshire.*

1828 John Conolly, M.D., *Hanwell.*

1839 John C. Cooke, M.D., 37, *Arundel-street, Strand.*

1840 *William Robert Cooke, *Burford, Oxfordshire.*

1840 Bransby Blake Cooper, F.R.S., *Surgeon to, and Lecturer on Surgery at, Guy's Hospital ;* 2, *New-street, Spring-gardens.* C. 1830. V.P. 1842.

1820 Benjamin Cooper, *Stamford.*

1819 George Cooper, *Brentford.*

1841 George Lewis Cooper, *Surgeon to the Bloomsbury Dispensary,* 35, *Keppel-street, Russell-square.*

1843 William White Cooper, *Senior Surgeon to the North London Ophthalmic Institution, and to the Honorable Artillery Company ;* 2, *Tenterden-street, Hanover-square.*

1841 Holmes Coote, *Demonstrator of Anatomy at St. Bartholomew's Hospital, Surgeon to the North London Ophthalmic Institution ;* 14, *Southampton-street, Bloomsbury.*

1835 George F. Copeland, *Cheltenham.*

1822 James Copland, M.D., F.R.S., *Consulting Physician to Queen Charlotte's Lying-in Hospital ;* 5, *Old Burlington-street.* C. 1830. V.P. 1838.

1847 John Rose Cormack, M.D., *Putney, Surrey.*

1839 *Charles C. Corsellis, M.D., *Resident Physician to the Lunatic Asylum, Wakefield.*

1814 *William Cother, *Surgeon to the Infirmary, Gloucester.*

1847 Richard Payne Cotton, M.D., *Assistant-Physician to the Hospital for Consumption and Diseases of the Chest ;* 4, *Bolton-street, Piccadilly.*

1828 William Coulson, *Surgeon to the Magdalen Hospital, Consulting Surgeon to the City Lying-in Hospital ; Frederick's-place, Old Jewry.* C. 1831. L. 1832.

1817 Sir Philip Crampton, Bart, F.R.S., *Surgeon-General to the Forces in Ireland.*

ELECTED

1841 M. A. N. Crawford, M.D., *Physician to, and Lecturer on Medicine at, the Middlesex Hospital;* 62, *Upper Berkeley-street, Portman-square.*

1822 Sir Alexander Crichton, M.D., F.R.S., and F.L.S., *Physician in Ordinary to their Imperial Majesties the Emperor and Dowager Empress of all the Russias.* C. 1823.

1847 George Critchett, *Assistant-Surgeon to the London Hospital, and the Royal London Ophthalmic Hospital; Finsbury-square.*

1837 John Farrar Crookes, 53, *Russell-square.*

1820 John Green Crosse, M.D., F.R.S., *Surgeon to the Norfolk and Norwich Hospital.*

1849 *William Edward Crowfoot, *Beccles, Suffolk.*

1818 William Cuming M.D., *Professor of Botany at the Glasgow Institution, and Surgeon to the Royal Infirmary at Glasgow.*

1837 Thomas Blizard Curling, *Lecturer on Surgery at, and Assistant-Surgeon to, the London Hospital;* 37, *New Broad-street.* S. 1845.

1846 Henry Curling, *Ramsgate.*

1847 J. Edmund Currey, M.D., *Lismore, Ireland.*

1836 George Cursham, M.D., *Physician to the Hospital for Consumption and Diseases of the Chest, and to the Female Orphan Asylum;* 5, *Saville-row.* S. 1842.

1822 Christopher John Cusack.

1828 Adolphe Dalmas, M.D., *Paris.*

1840 John Dalrymple, F.R.S., *Surgeon to the London Ophthalmic Hospital;* 56, *Grosvenor-street.* C. 1848.

1836 *James S. Daniel, *Ramsgate.*

1820 George Darling, M.D., 6, *Russell-square.* C. 1841.

1818 *Sir Francis Sacheverel Darwin, Knt., M.D.; *Breadsall Priory, near Derby.*

1848 Henry Daubeny, 28, *Upper Gloucester-place.*

1818 Henry Davies, M.D., VICE-PRESIDENT; *Physician to the British Lying-in Hospital, Brownlow-street; Physician-Accoucheur to the Marylebone General Dispensary; Saville-row.* C. 1827.

1846 Frederick Davies, 19, *Upper Gower-street, Bedford-square.*

1847 John Davies, M.D., *Physician to the Hertford Infirmary, and*

ELECTED

*Visiting Physician to the County Gaol and Lunatic Asylum, Hertford.*

1820 Thomas Davis, *Brook-street, Hanover-square.* C. 1843.

1818 James Dawson, *Liverpool.*

1841 Campbell De Morgan, *Surgeon to, and Lecturer on Anatomy at, the Middlesex Hospital;* 17, *Manchester-street.*

1846 *Samuel Best Denton, *Ivy-lodge, Hornsea, East Riding, Yorkshire.*

1847 George E. Day, M.D., 27, *Upper Seymour-street, Portman-square.*

1816 *Sir David James Hamilton Dixon, M.D., F.R.S. Ed., and F.L.S., *Physician to the Fleet, and to the Royal Naval Hospital, Plymouth.*

1839 James Dixon, Librarian; *Assistant-Surgeon to St. Thomas's Hospital, and Surgeon to the Royal London Ophthalmic Hospital;* 37, *Broad-street-buildings.*

1844 Robert Dickon, M.D., 16, *Hertford-street, May-fair.*

1845 John Dodd, 1, *Bryanston-street, Portman-square.*

1839 Henry Pye-Lewis Drew, 79, *Gower-street, Bedford-square.*

1846 John Drummond, *Deputy Inspector of Fleets and Hospitals; Royal Naval Hospital, Woolwich.*

1843 Thomas Jones Drury, M.D., *Physician to the Salop Infirmary; Shrewsbury.*

1845 George Duff, M.D., *Genoa.*

1845 Edward Duffin, *Langham-place, Portland-place.*

1833 Robert Dunn, *Norfolk-street, Strand.* C. 1845.

1843 C. M. Durrant, M.D., *Physician to the East Suffolk and Ipswich Hospital; Ipswich.*

1839 Henry Dyer, M.D., 37, *Bryanston-square.*

1836 J. W. Earle, *Cheltenham.*

1824 George Edwards.

1823 C. C. Egerton, *India.*

1838 Thomas Elliotson, M.D., *Clapham.*

1848 George Viner Ellis, jun., *Professor of Anatomy in University College, London; Albert-street, Regent's-park.*

1835 William England, M.D., *Wisbeach.*

1842 John E. Erichsen, *Assistant-Surgeon to University College Hospital, and Surgeon to the City of London Hospital for Diseases of the Chest, &c.;* 48, *Welbeck-street, Cavendish-square.*

ELECTED

1815 G. F. D. Evans, M.D., *High-street, Bedford.* C. 1838.

1836 George F. Evans, M.B., *Physician to the Birmingham Hospital.*

1845 William Julian Evans, M.D.

1841 Sir James Eyre, M.D., *Physician-Accoucheur to St. George's and St. James's Dispensary;* 11, *Brook-street, Grosvenor-square.*

1844 Arthur Farre, M.D., F.R.S., *Professor of Midwifery in King's College, London; Curzon-street, May-fair.*

1831 Robert Ferguson, M.D., *Physician-Accoucheur to the Queen, Physician to the Westminster Lying-in Hospital;* 125, *Park-street, Grosvenor-square.* C. 1839. V.P. 1847.

1841 William Fergusson, F.R.S. Ed., *Professor of Surgery in King's College, London; and Surgeon to King's College Hospital; George-street, Hanover-square.*

1836 John W. Fisher, *Surgeon in Chief to the Metropolitan Police Force;* 7, *Upper Grosvenor-street.* C. 1843.

1839 George Lionel Fitzmaurice, 97, *Gloucester-place, Portman-square.*

1842 Thomas Bell Elcock Fletcher, M.D., *Physician to the General Dispensary, Birmingham.*

1841 John Forbes, M.D., F.R.S., *Physician to Her Majesty's Household;* 12, *Old Burlington-street.*

1848 John Gregory Forbes, 14, *Devonport-street, Hyde-park.*

1817 *Robert T. Forster, *Southwell.*

1820 Thomas Forster, M.D., *Hartfield-lodge, East Grinsted.*

1846 Algernon Frampton, M.D., *Physician to the London Hospital; New Broad-street.*

1816 John W. Francis, M.D., *Professor of Materia Medica in the University of New York.*

1841 J. Ch. August. Franz, M.D., *Royal German Spa, Brighton.*

1843 Patrick Fraser, M.D., *Assistant-Physician to the London Hospital; Guildford-street, Russell-square.*

1846 Joseph Freeman, 21, *Spring-gardens.*

1836 John G. French, *Surgeon to St. James's Infirmary;* 41, *Great Marlborough-street.*

1849 Robert Temple Frere, 9, *Queen-street, May-fair.*

1846 Henry William Fuller, M.B., *Assistant-Physician to, and Lecturer on Medical Jurisprudence at, St. George's Hospital;* 45, *Half Moon-street, Piccadilly.*

ELECTED

1815 *George Frederick Furnival, *Egham.*

1848 John Gay, *Surgeon to the Royal Free Hospital;* 10, *Finsbury-place, Finsbury-square.*

1819 John Samuel Gaskoin, 32, *Clarges-street.* C. 1836.

1819 Henry Gaulter.

1821 *Richard Francis George, *Surgeon to the Bath Hospital.*

1841 J. Durancè George, F.G.S., *Lecturer on Dental Surgery at University College, and Dental Surgeon to University College Hospital;* 32, *Old Burlington-street.*

1812 George Goldie, M.D., *York.*

1837 Richard H. Goolden, M.D., *Assistant-Physician to St. Thomas's Hospital;* 41, *Sussex-gardens, Hyde-park.*

1818 James Alexander Gordon, M.D., F.R.S. C. 1828. V.P. 1829.

1844 John Grantham, *Crayford, Kent.*

1846 George Thompson Gream, *Surgeon to Queen Charlotte's Lying-in Hospital;* 42, *Hertford-street, May-fair.*

1816 Joseph Henry Green, F.R.S., *Surgeon to, and Lecturer on Surgery at, St. Thomas's Hospital; Hadley, Middlesex.* C. 1820. V.P. 1830.

1841 George Gregory, M.D., *Physician to the Small-pox Hospital;* 6, *Camden-square, Camden New-town.* S. 1825. C. 1849.

1843 Robert Greenhalgh, *Upper Charlotte-street, Fitzroy-square.*

1814 John Grove, M.D., *Salisbury.*

1837 James Manby Gully, M.D., *Holyrood-house, Great Malvern*

1819 John Gunning, *Inspector of Hospitals; Paris.*

1841 Charles Guthrie, *Assistant-Surgeon to the Westminster Ophthalmic Hospital; Albemarle-street.*

1827 Marshall Hall, M.D., F.R.S., *Manchester-square.* L. 1828. C. 1840. V.P. 1843.

1842 *George Hall, M.D., 14, *Old Steine, Brighton.*

1845 John Hall, M.D., *Deputy Inspector-General of Hospitals; Cape of Good Hope.*

1848 Alexander Halley, M.D., *Queen Anne-street, Cavendish-square.*

1819 Thomas Hammerton, 111, *Piccadilly.* C. 1829.

1838 Henry Hancock, *Surgeon to the Charing-cross Hospital; Harley-street.*

1848 *George Harcourt, M.D., *Chertsey, Surrey.*

ELECTED

1836 J. F. Harding, 6, *Mylne-street, Myddelton-square.*

1843 Thomas Sunderland Harrison, M.D., F.L.S., *Garston-lodge, Somersetshire.*

1846 John Harrison, *The Court-yard, Albany.*

1841 William Harvey, *Surgeon to the Royal Dispensary for Diseases of the Ear, and to the Freemasons' Female Charity;* 2, *Soho-square.*

1816 *John Haviland, M.D., *Regius Professor of Physic in the University of Cambridge; Physician to Addenbrooke's Hospital; Cambridge.*

1828 Cæsar H. Hawkins, *Surgeon to St. George's Hospital;* 26, *Lower Grosvenor-street.* C. 1830. V.P. 1838. T. 1841.

1838 Charles Hawkins, 22, *Saville-row.* C. 1846.

1848 Thomas Hawksley, 57, *Margaret-street, Cavendish-square.*

1820 Thomas Emerson Headlam, M.D., *Newcastle-upon-Tyne.*

1848 James Newton Heale, M.D., 11, *Westbourne-crescent, Hyde-park.*

1829 Thomas Heberden, M.D., 11, *Upper Brook-street.*

1844 John Hennen, M.D., LIBRARIAN; *Physician to the Western General Dispensary;* 24, *Upper Southwick-street, Hyde-park.*

1848 Mitchell Henry, *Assistant-Surgeon to the Middlesex Hospital;* 5, *Harley-street, Cavendish-square.*

1849 Amos Henriques, 67, *Upper Berkeley-street, Portman-square.*

1821 Vincent Herberski, M.D., *Professor of Medicine in the University of Wilna.*

1843 Prescott Gardner Hewett, *Assistant-Surgeon to St. George's Hospital; Lecturer on Anatomy at St. George's Hospital Medical School;* 35, *Hertford-street, May-fair.*

1841 *Nathaniel Highmore, *Consulting-Surgeon to the Weymouth and Dorsetshire Eye Infirmary; Sherborne.*

1814 *William Hill, *Wooton-under-Edge.*

1842 William Augustus Hillman, *Lecturer on Anatomy and Physiology at the Westminster Hospital, Surgeon to the Farringdon General Dispensary;* 1, *Argyll-street, Regent-street.*

1841 John Hilton, F.R.S., *Assistant-Surgeon to, and Lecturer on Anatomy at, Guy's Hospital;* 10, *New Broad-street.*

ELECTED

1848 Martin Thomas Hiscox, M.D., *Bath, Somerset.*

1840 Thomas Hodgkin, M.D., 9, *Brook-street.* C. 1842.

1813 Joseph Hodgson, F.R.S., 38, *Westbourne-terrace, Hyde-park.* C. 1817.

1835 T. H. Holberton, *Surgeon Extraordinary to the Queen Dowager; Hampton.*

1843 Luther Holden, 39, *Ely-place, Holborn.*

1814 Henry Holland. M.D., F.R.S., *Physician Extraordinary to the Queen, and Physician in Ordinary to His Royal Highness Prince Albert;* 25, *Brook-street.* C. 1817. V.P. 1826.

1846 Barnard Wight Holt, *Assistant-Surgeon to the Westminster Hospital;* 5, *Parliament-street.*

1846 Carsten Holthouse, *Surgeon to the Public Dispensary, Lincoln's Inn; Lecturer on Anatomy and Physiology;* 3, *Serle-street, Lincoln's-inn-fields.*

1819 *John Howell, M.D., F.R.S. Ed.; *Clifton.*

1828 *Edward Howell, M.D., *Swansea.*

1844 Edwin Humby, *Windsor-terrace, Maida-hill.*

1822 Robert Hume, M.D., *Inspector of Hospitals; Commissioner in Lunacy;* 9, *Curzon-street.* V.P. 1836.

1840 Henry Hunt, M.D., *Brook-street, Hanover-square.*

1842 Christopher Hunter, *Downham, Norfolk.*

1849 Edward Law Hussey, *Oxford.*

1820 William Hutchinson, M.D.

1840 Charles Hutton, M.D., *Physician to the Royal Infirmary for Children;* 26, *Lowndes-street, Belgrave-square.*

1848 George Cockburn Hyde, 5, *Montpelier-square, Brompton.*

1838 William Ifil, M.D.

1847 William Edmund Image, *Surgeon to the Suffolk General Hospital; Bury St. Edmund's.*

1826 William Ingram, *Midhurst.*

1839 A. R. Jackson, M.D., *East India Company's Depôt, Warley Barracks, Essex.*

1845 *Henry Jackson, *Surgeon to the Sheffield General Infirmary; St. James's-row, Sheffield.*

1841 Paul Jackson, *Thayer-street, Manchester-square.*

1847 Thomas Reynolds Jackson, 28, *Charles-street, St. James's.*

1841 Maximilian M. Jacobovicz, M.D., *Pesth.*

ELECTED

1825 John B. James, M.D.

1847 *William Withall James, *Exeter, Devon.*

1844 Samuel John Jeafferson, M.D., *Warwick.*

1839 Julius Jeffreys, F.R.S.

1840 *G. Samuel Jenks, M.D., *Brighton.*

1848 Athol Johnson, *Lecturer on Physiology and General Anatomy at St. George's Hospital;* 9, *Old Bond-street.*

1821 Edward Johnson, M.D., *Weymouth.*

1847 George Johnson, M.D., *Assistant-Physician to King's College Hospital: King's College, Strand.*

1837 Henry Charles Johnson, *Assistant-Surgeon to, and Lecturer on Medical Jurisprudence at, St. George's Hospital; Saville-row.*

1844 John Johnston, 16, *Dover-street, Piccadilly.*

1844 Henry Bence Jones, M.A., F.R.S., *Physician to, and Lecturer on Chemistry at, St. George's Hospital; Lower Grosvenor-street.*

1835 H. D. Jones, 20, *Soho-square.*

1837 T. W. Jones, M.D., 19, *Finsbury-pavement, Finsbury-square.*

1829 *G. Julius, *Richmond.*

1816 *George Hermann Kauffman, M.D., *Hanover.*

1815 Robert Keate, *Serjeant-Surgeon to the Queen, Surgeon to the Queen Dowager, to H.R.H. the Duke of Cambridge, to H.R.H. the Duchess of Gloucester, and to St. George's Hospital;* 11, *Hertford-street, May-fair.* C. 1818. V.P. 1826.

1848 *Daniel Burton Kendell, M.D., 7, *St. John's, Wakefield, Yorkshire.*

1847 Alfred Keyser, *Norfolk-crescent, Oxford-square.*

1839 *David King, M.D., *Eltham.*

1836 P. Nugent Kingston, M.D., *Physician to, and Lecturer on Medicine at, the Westminster Hospital; Curzon-street, May-fair.* C. 1846.

1806 James Laird, M.D.

1840 Samuel Lane, *Assistant-Surgeon to the Lock Hospital, and Lecturer on Anatomy; Grosvenor-place.*

1841 *Charles Lashmar, M.D., *Croydon, Surrey.*

1816 G. E. Lawrence.

1809 William Lawrence, F.R.S., *Surgeon Extraordinary to the*

ELECTED

*Queen; Surgeon to St. Bartholomew's Hospital, and to Bridewell and Bethlem Hospitals; Lecturer on Surgery at St. Bartholomew's Hospital;* 18, *Whitehall-place.* S. 1813. V.P. 1818. C. 1820. T. 1821. P. 1831.

1840 Thomas Laycock, M.D., *York.*

*Jesse Leach, *Heywood, near Bury, Lancashire.*

1823 John G. Leath, M.D.

1822 John Joseph Ledsam, *Surgeon to the Birmingham Eye Infirmary.*

1823 Henry Lee, M.D., 20, *Keppel-street, Russell-square.* C. 1837. S. 1839.

1843 Henry Lee, *Assistant-Surgeon to King's College Hospital, and Assistant-Surgeon to the Lock Hospital;* 13, *Dover-street, Piccadilly.*

1846 Thomas Safford Lee, *Cambridge.*

1836 Frederick Leighton, M.D.

1847 John C. W. Lever, M.D., *Physician-Accoucheur to Guy's Hospital; Wellington-street, Borough.*

1847 Sir John Liddell, M.D., F.R.S., *Inspector of Hospitals; Royal Hospital, Greenwich.*

1806 John Lind, M.D.

1845 William Little, M.D., *Physician to, and Lecturer on Medicine at, the London Hospital; Finsbury-square.*

1818 Robert Lloyd, M.D.

1824 Eusebius Arthur Lloyd, *Surgeon to St. Bartholomew's Hospital, and Surgeon to Christ's Hospital;* 14, *Bedford-row.* S. 1827. V. P. 1838. C. 1843.

1820 J. G. Locher, M.C.D., *Town Physician of Zurich.*

1824 Charles Locock, M.D., *First Physician-Accoucheur to the Queen; Physician Extraordinary to the Queen Dowager, and Consulting Physician to the General Lying-in Hospital; Hertford-street, May-fair.* C. 1826. V.P. 1841.

1846 Henry Thomas Lomax, *Stafford.*

1844 Edward Lonsdale, *Assistant-Surgeon to the Orthopædic Institution;* 26, *Montague-street, Russell-square.*

1836 Joseph S. Löwenfeld, M.D., *Berbice.*

1815 *Peter Luard, M.D.

1814 Sir James Macgrigor, Bart., K.T.S., M.D., LL.D., F.R.S. L. and Ed., *Director-General of the Medical Department*

ELECTED

*of the Army;* 3, *Harley-street, Cavendish-square.* C. 1820. V.P. 1815.

1823 George Macilwain, VICE-PRESIDENT; *Consulting Surgeon to the Finsbury Dispensary; The Court-yard, Albany.* C. 1829.

1818 W. Mackenzie, *Surgeon to the Eye Infirmary, Glasgow.*

1822 Richard Mackintosh, M.D.

1847 Henry John McDougall, 24, *Henrietta-street, Cavendish-square.*

1846 William M'Ewen, M.D., *Surgeon to the Cheshire County Gaol, and House-Surgeon to the Chester General Infirmary; Newgate-street, Chester.*

1839 William Macintyre, M.D., *Harley-street.*

1848 Frederick Wm. Mackenzie, M.D., 11, *Chester-place, Hyde-park-square.*

1844 Daniel Maclachlan, M.D., *Physician to the Royal Hospital, Chelsea; and Deputy Inspector-General of Hospitals.*

1849 D. Macloughlin, M.D., *Brook-street, Grosvenor-square.*

1849 Duncan M. Maclure 14, *Harley-street.*

1842 John Macnaught, M.D., *Bedford-street, Liverpool.*

1835 D. C. Macreight, M.D., *St. Hillier's, Jersey.*

1837 A. M. M'Whinnie, *Lecturer on Comparative Anatomy at St. Bartholomew's Hospital; Bridge-street, Blackfriars.*

1836 John Malyn.

1848 W. O. Markham, M.D., 20, *Cork-street, Bond-street.*

1824 Sir Henry Marsh, Bart., M.D., *Dublin.*

1838 Thomas Parr Marsh, M.D., *Physician to the Salop Infirmary, Shrewsbury.*

1840 John Marston, 6, *Devonshire-street, Portland-place.*

1841 James Ranald Martin, F.R.S., 71 A, *Grosvenor-street.*

1819 *John Masfen, *Surgeon to the County General Infirmary, and Fever Hospital, Stafford.*

1849 George Bellasis Masfen, *Stafford.*

1818 J. P. Maunoir, *Professor of Surgery at Geneva.*

1820 Herbert Mayo, F.R.S. S. 1825. V.P. 1834.

1837 Thomas Mayo, M.D., F.R.S., *Physician to the St. Marylebone Infirmary; Wimpole-street.* S. 1841. C. 1847.

1839 R. H. Meade, *Bradford, Yorkshire.*

1819 *Thomas Medhurst, *Hurstbourne Tarrant.*

ELECTED

1847 Edward Meryon, M.D., 14, *Clarges-street, Piccadilly.*

1837 S. W. J. Merriman, M.D., *Consulting Physician to the Westminster General Dispensary, and Assistant-Physician to the West London Lying-in Institution; Brook-street.*

1815 Augustus Meyer, M.D., *St. Petersburg.*

1840 Richard Middlemore, *Surgeon to the Eye Infirmary, Birmingham.*

1847 James Miller, M.D., 40, *Welbeck-street, Cavendish-square.*

1818 *Patrick Miller, M.D., F.R.S. Ed., *Physician to the Devon and Exeter Hospitals, and to the Lunatic Asylum; Exeter.*

1848 Gavin Milroy, M.D., *Fitzroy-square.*

1844 Nathaniel Montefiore, 4, *Great Stanhope-street, Park-lane.*

1828 Joseph Moore, M.D., *Physician to the Royal Freemasons' Female Charity; Consulting Physician to Queen Charlotte's Lying-in Hospital;* 10, *Saville-row.* C. 1837.

1836 George Moore, M.D., *Hastings.*

1848 Charles Hewitt Moore, *Surgeon to the Middlesex Hospital;* 26, *Mortimer-street, Cavendish-square.*

1842 Thomas Morton, *Surgeon to University College Hospital, and Surgeon to the Queen's Bench Prison;* 7, *Woburn-place, Russell-square.*

1814 *George Frederick Muhry, M.D., *Hanover.*

1847 Simon Murchison, 16, *Chester-terrace, Chester-square.*

1841 Edward William Murphy, M.D., *Professor of Midwifery in University College; Henrietta-street, Cavendish-square.*

1845 Thomas D. Mütter, M.D., *Professor of Surgery in Jefferson Medical College; Philadelphia.*

1840 Robert Nairne, M.D., *Physician to, and Lecturer on Medicine at, St. George's Hospital;* 44, *Charles-street, Berkeley-square.* C. 1848.

1835 Thomas Andrew Nelson, M.D., 41, *George-street, Portman-square.*

1843 Edward Newton, *Howland-street, Fitzroy-square.*

1816 Thomas Nixon (*Army*).

1819 *George Norman, *Surgeon to the United Hospital and Puerperal Charity; Bath.*

1849 Henry Burford Norman, *Surgeon to the St. Marylebone Dispensary, and to the Western Ophthalmic Institution;* 3, *Duchess-street, Portland-place.*

ELECTED

1845 Henry Norris, *South Petherton, Somerset.*

1829 John North, *Gloucester-place.* C. 1835.

1849 *Arthur Novere, *Great Stanmore, Middlesex.*

1847 *William E. C. Nourse, *Santry-house, Dublin.*

1843 William O'Connor, 21, *George-street, Portman-square.*

1847 Thomas O'Connor, *March, Cambridgeshire.*

1846 Francis Odling, *Devonshire-street, Portland-place.*

1822 James Adey Ogle, M.D., F.R.S., *Clinical and Aldrichian Professor of Medicine, Oxford; and Senior Physician to the Radcliffe Infirmary.*

1842 William Piers Ormerod, *Surgeon to the Radcliffe Infirmary, Oxford.*

1846 Edward Latham Ormerod, M.D., 12, *Old Steyne, Brighton.*

1844 Drewry Ottley, *Bedford-place, Russell-square.*

1847 William Emanuel Page, M.D., *Physician to, and Lecturer on Medicine at, St. George's Hospital; Curzon-street, May-fair.*

1847 *William Bousfield Page, *Surgeon to the Cumberland Infirmary; Carlisle.*

1840 James Paget, *Assistant-Surgeon to, and Lecturer on General and Morbid Anatomy and Physiology, and Warden of the Collegiate Establishment at, St. Bartholomew's Hospital.* C. 1848.

1806 *Robert Paley, M.D., *Bishopston-grange, near Ripon, Yorkshire.*

1836 J. W. Langston Parker, *Birmingham.*

1847 Nicholas Parker, M.B., *Microscopical Demonstrator of Morbid Anatomy at the London Hospital School of Medicine; Finsbury-square.*

1841 John Parkin, 7, *Thurloe-place, Brompton.*

1828 Richard Partridge, F.R.S., *Surgeon to King's College Hospital, and Professor of Anatomy in King's College, London;* 17, *New-street, Spring-gardens.* S. 1832. C. 1837. V.P. 1847.

1819 Granville Sharp Pattison, *New York.*

1845 Thomas Bevill Peacock, M.D., *Physician to the Royal Free Hospital and Royal General Dispensary;* 20, *Finsbury-circus*

1830 Charles P. Pelechin, M.D., *St. Petersburg.*

1819 John Pryor Peregrine, *Penzance, Cornwall.*

ELECTED

1839 Thomas Peregrine, M.D., 3, *Half-moon-street.*

1831 Jonathan Pereira, M.D., F.R.S., F.L.S., *Assistant-Physician to, and Lecturer on Materia Medica at, the London Hospital; Finsbury-square.* C. 1844. V.P. 1847.

1844 William V. Pettigrew, 7, *Chester-street, Grosvenor-place.*

1814 *Edward Phillips, M.D., *Physician to the County Hospital; Winchester.*

1837 Benjamin Phillips, F.R.S., TREASURER; *Surgeon to, and Lecturer on Surgery at, the Westminster Hospital;* 17, *Wimpole-street.* L. 1841. T. 1847.

1848 Edward Phillips, M.D., *Coventry.*

1846 Francis Richard Philp, M.D., *Physician to St. Luke's Hospital;* 28, *Grosvenor-street.*

1836 Isaac Pidduck, M.D., 22, *Montague-street, Russell-square.*

1841 Henry Pitman, M.D., *Assistant-Physician to, and Lecturer on Materia Medica at, St. George's Hospital; Montague-place, Russell-square.*

1845 George David Pollock, *Surgeon to the North London Ophthalmic Institution, and Lecturer on Anatomy at St. George's Hospital Medical School;* 27, *Grosvenor-street.*

1843 Charles Pope, M.D., M.A., F.L.S., *Temple Cloud, near Bristol.*

1846 Jephson Potter, M.D., F.L.S., 13, *Oxford-road, Manchester.*

1840 Lewis Powell, *John-street, Berkeley-square.*

1842 James Powell, M.B., *Great Coram-street, Brunswick-square.*

1839 John Propert, *New Cavendish-street.*

1814 William Prout, M.D., F.R.S., *Sackville-street.* C. 1816. V.P. 1823.

1845 John Pyle, *Surgeon to the North London Ophthalmic Institution; Oxford-terrace, Hyde-park.*

1816 Sir William Pym, M.D., *Inspector of Hospitals.*

1830 Jones Quain, M.D., *Paris.*

1835 Richard Quain, F.R.S., *Surgeon to University College Hospital, and Professor of Clinical Surgery and of Anatomy in University College; Keppel-street.* C. 1838. L. 1846.

1807 John Ramsey, M.D., *Physician to the Infirmary at Newcastle.*

1821 Henry Reeder, M.D., *Ridge House, Chipping, Sudbury.*

1835 G. Regnoli, *Professor of Surgery in the University of Pisa.*

1842 David Boswell Reid, M.D., *House of Commons.*

ELECTED

1846 James Reid, M.D., *Physician to the Infirmary of St. Giles and Bloomsbury; General Lying-in Hospital, &c.;* 29, *Brook-street.*

1847 Samuel Richards, M.D., 36, *Bedford-square.*

1829 Sir John Richardson, M.D., F.R.S., *Surgeon to the Naval Hospital; Chatham.*

1849 William Richardson, *Radnor-place, Hyde-park.*

1843 Joseph Ridge, M.D., *Cavendish-square.*

1845 Benjamin Ridge, M.D., *Putney, Surrey.*

1821 Charles Julius Roberts, M.D., *Physician to the Adult Deaf and Dumb and Welsh Charity;* 31, *New Bridge-street.* C. 1827.

1829 *Archibald Robertson, M.D., F.R.S. L. and Ed., *Physician to the General Infirmary, Northampton.*

1843 George Robinson, M.D., 40, *Blackett-street, Newcastle-on-Tyne.*

1845 J. M. Edward Roche, M.D., *Uzès, Gard, France.*

1843 William Roden, M.D., M.A., F.L.S., *Kidderminster, Worcestershire.*

1835 George Hamilton Roe, M.D., *Physician to, and Lecturer on Medicine at, the Westminster Hospital;* 6, *Hanover-square.* C. 1841.

1836 Arnold Rogers, 296, *Regent-street.*

1846 William Rogers, M.D., 56, *Berners-street.*

1819 Henry S. Roots, M.D., *Consulting-Physician to St. Thomas's Hospital;* 2, *Russell-square.* C. 1833. V.P., 1834.

1829 Sudlow Roots.

1836 Richard Roscoe, M.D., *Great Ormond-street, Queen-square.*

1835 *Caleb B. Rose, *Swaffham.*

1849 C. Henry F. Routh, M.D., 19, *Dorset-square.*

1845 Henry Mortimer Rowdon, *Lecturer on Anatomy at the Middlesex Hospital School of Medicine;* 35, *Baker-street, Portman-square.*

1841 Richard Rowland, M.D., *Physician to the Bloomsbury Dispensary;* 9, *Woburn-place, Russell-square.*

1836 James Russell, *Birmingham.*

1845 James Russell, jun., *Birmingham.*

1827 *Thomas Salter, F.L.S., *Poole.*

1844 *Thomas Bell Salter, M.D., F.L.S., *Ryde, Isle of Wight.*

1842 George Sampson, 12, *Chester-street, Belgrave-square.*

ELECTED

1849 Hugh James Sanderson, 29, *Upper Berkeley-street, Portman-square.*

1847 William H. O. Sankey, *London Fever Hospital; St. Pancras.*

1845 Edwin Saunders, *Surgeon-Dentist to the Queen, and Lecturer on Diseases of the Teeth at St. Thomas's Hospital;* 13, *George-street, Hanover-square.*

1834 Ludwig V. Sauvan, M.D., *Warsaw.*

1840 Augustin Sayer, M.D., 28, *Upper Seymour-street.*

1824 Edward J. Seymour, M.D., F.R.S., *Charles-street, Berkeley-square.* C. 1826. S. 1827. V.P. 1830.

1840 William Sharp, F.R.S., F.G.S., F.R.A.S., *late Senior Surgeon to the Bradford Infirmary; Rugby, Warwickshire.*

1837 William Sharpey, M.D., F.R.S. L. and Ed., *Professor of Anatomy and Physiology in University College, London; Gloucester-crescent, Regent's-park.* C. 1848.

1836 Alexander Shaw, *Surgeon to the Middlesex Hospital; Henrietta-street, Cavendish-square.* C. 1842. S. 1843.

1848 *Edward James Shearman, M.D., *Rotherham, Yorkshire.*

1849 Francis Sibson, M.D., F.R.S., 15, *Brook-street, Grosvenor-square.*

1848 Edward Henry Sieveking, M.D., 59, *Brook-street, Grosvenor-square.*

1839 Thomas Silvester, M.D., *High-street, Clapham.*

1842 John Simon, F.R.S., *Lecturer on Pathology at St. Thomas's Hospital;* 3, *Lancaster-place, Strand.*

1821 Charles Skene, M.D., *Professor of Anatomy and Surgery; Marischal College, Aberdeen.*

1827 George Skene, *Bedford.*

1824 Frederick C. Skey, F.R.S., *Assistant-Surgeon to, and Lecturer on Anatomy at, St. Bartholomew's Hospital; Surgeon to the Northern Dispensary; Grosvenor-street.* C. 1828. L. 1829. V.P. 1841.

1810 Noel Thomas Smith, M.D., *Newcastle.*

1835 John Gregory Smith, *Harewood, Yorkshire.*

1838 Henry Smith, *Surgeon to the General Dispensary, Aldersgate-street;* 21, *Upper Seymour-street, Portman-square.*

1845 William Smith, 12, *Park street, Bristol.*

1847 William Smith, M.D., *Weymouth, Dorsetshire.*

ELECTED

1843 Robert William Smith, A.M., M.D., M.R.I.A., *Lecturer on Surgery at the Richmond Hospital School of Medicine; Surgeon to the Talbot General Dispensary and Island Bridge Lunatic Asylum;* 62, *Eccles-street, Dublin.*

1843 John Snow, M.D., *Frith-street, Soho-square.*

1819 *George Snowden, *Ramsgate.*

1816 *John Smith Soden, *Sunbury, Middlesex.*

1830 Samuel Solly, F.R.S., VICE-PRESIDENT; *Senior Assistant-Surgeon to St. Thomas's Hospital; Surgeon to the General Dispensary, Aldersgate-street;* 1, *St. Helen's-place.* L. 1838. C. 1845.

1844 Frederick R. Spackman, M.B., *Harpenden, St. Alban's.*

1834 James Spark, *Newcastle.*

1843 *Stephen Spranger, *Grantham, Lincolnshire.*

1838 George James Squibb, 6, *Orchard-street.*

1835 Richard A. Stafford, *Surgeon Extraordinary to His Royal Highness the Duke of Cambridge; Surgeon to the St. Marylebone Infirmary; Old Burlington-street.* C. 1840.

1815 Edward Stanley, F.R.S., *President of the Royal College of Surgeons, Surgeon to St. Bartholomew's Hospital;* 23 A, *Brook-street.* C. 1821. S. 1824. V.P. 1827. T. 1832. P. 1843.

1842 Alexander Patrick Stewart, M.D., *Physician to the St. Pancras Dispensary;* 74, *Grosvenor-street.*

1839 Thomas Stone, M.D., 34, *Tonbridge-place, Euston-square.*

1843 Robert Reeve Storks.

1844 John Soper Streeter, *Harpur-street, Red Lion-square.*

1827 William Strood, M.D., 20, *Great Coram-street.* C. 1831.

1847 William Allen Sumner, *Abbey-road, St. John's Wood.*

1839 Alexander John Sutherland, M.D., F.R.S., *Physician to St. Luke's Hospital; Parliament-street.*

1842 James Syme, *Professor of Clinical Surgery in the University of Edinburgh; Charlotte-square, Edinburgh.*

1844 R. W. Tamplin, *Surgeon to the Orthopædic Institution, Great Queen-street, Lincoln's-inn-fields.*

1848 Thomas Hawkes Tanner, M.D., *Physician to the Farringdon Dispensary;* 10, *Charlotte-street, Bedford-square.*

1840 Thomas Tatum, *Surgeon to, and Lecturer on Surgery at, St. George's Hospital; George-street, Hanover-square.*

ELECTED

1835 J. C. Taunton, *Surgeon to the City of London Truss Society, and to the City Dispensary;* 48, *Hatton-garden.* C. 1840.

1845 *John Taylor, M.D., *Physician to the Infirmary; Huddersfield.*

1845 Thomas Taylor, *Vere-street, Cavendish-square.*

1817 Frederick Thackeray, M.D., *Physician to Addenbrooke's Hospital, Cambridge.*

1845 Evan Thomas, *Pwllheli, North Wales.*

1839 Seth Thompson, M.D., *Physician to, and Lecturer on Medicine at, the Middlesex Hospital;* 1, *Lower Seymour-street.*

1842 Theophilus Thompson, M.D., F.R.S., *Physician to the Northern Dispensary, and to the Hospital for Consumption and Diseases of the Chest;* 3, *Bedford-square.*

1835 Frederick Hale Thomson, *Surgeon to the Westminster Hospital; Berners-street.*

1819 John Thomson, M.D., F.L.S., *Physician to the Finsbury Dispensary;* 1, *Pullin's-place, High-street, Islington.* C. 1833. L. 1834.

1836 John Thurnam, M.D., *The Retreat, York.*

1848 Edward John Tilt, M.D., *Physician to the Farringdon Dispensary;* 42, *Gloucester-road, Hyde-park-gardens.*

1834 Robert Bentley Todd, M.D., F.R.S., *Physician to King's College Hospital, Professor of Physiology and of General and Morbid Anatomy in King's College; New-street, Spring-gardens.* L. 1842.

1828 James Torrie, M.D., *Aberdeen.*

1843 Joseph Toynbee, F.R.S., *Surgeon to the St. George's and St. James's Dispensary;* 12, *Argyll-place, Regent-street.*

1808 Benjamin Travers, F.R.S., *Surgeon Extraordinary to the Queen; Surgeon in Ordinary to His Royal Highness Prince Albert;* 12, *Bruton-street.* C. 1810. V.P. 1817. P. 1827.

1821 *William Travirs, M.D., *Scarborough.*

1841 Matthew Truman, M.D., 44, *Gloucester-place, Kentish-town.*

1835 John Cusson Turner, M.D., *Brighton.*

1845 Thomas Turner, *Surgeon to the Royal Manchester Infirmary, and Lecturer on Anatomy; Mosley-street, Manchester.*

ELECTED

1819 Barnard Van Oven, *Consulting Surgeon to the Charity for Delivering Jewish Lying-in Women;* 30, *Gower-street, Bedford-square.*

1806 Bowyer Vaux, *Surgeon to the General Hospital, Birmingham.*

1839 W. R. Vickers, 32, *Baker-street.*

1814 John P. Vincent, 16, *Lincoln's-inn-fields.* C. 1823. V.P. 1837.

1810 James Vose, M.D.

1846 Alexander Ure, *Surgeon to the Westminster General Dispensary;* 24, *Bloomsbury-square.*

1828 Benedetto Vulpes, M.D., *Physician to the Hospital of Aversa, and to the Hospital of Incurables, Naples.*

1841 Robert Wade, *Surgeon to the Westminster General Dispensary;* 68, *Dean-street, Soho.*

1823 William Wagner, M.D., *Berlin.*

1820 Thomas Walker, M.D., *Physician to the Forces;* 10, *Lower Seymour-street.*

1821 Tilleard Ward, *York-place, Portman-square.*

1845 T. Ogier Ward, M.D., *Leonard-place, Kensington.*

1846 Nathaniel Ward, *Assistant-Surgeon to, and Demonstrator of Anatomy at, the London Hospital;* 1, *Broad-street-buildings.*

1814 Martin Ware, 51, *Russell-square.* C. 1844. T. 1846.

1811 John Ware.

1846 James Thomas Ware, *Surgeon to the Finsbury Dispensary;* 51, *Russell-square*

1816 *Charles Bruce Warner, *Cirencester.*

1829 E. T. Warry, *Lyndhurst.*

1837 Thomas Watson, M.D., *Henrietta-street, Cavendish-square.* C. 1840. V.P. 1845.

1847 *Thomas Watson, *Holbeach, Lincolnshire.*

1842 Frederick Weber, M.D., *Physician to the St. George's and St. James's Dispensary; Norfolk-street, Park-lane.*

1844 William Wegg, M.D., *Physician to the Westminster General Dispensary;* 5, *Maddox-street, Hanover-square.*

1842 Charles West, M.D., *Lecturer on Midwifery at St. Bartholomew's Hospital; Physician-Accoucheur to the Middlesex Hospital, and Senior Physician to the Royal Infirmary for Children;* 96, *Wimpole-street, Cavendish-square.*

ELECTED

1841 Thomas West, M.D., F.L.S., *Daventry.*

1840 William Woodham Webb, *Gislingham, near Thwaite, Suffolk.*

1835 John Webster, M.D., F.R.S., *Consulting Physician to the St. George's and St. James's Dispensary;* 24, *Brook-street.* C. 1843.

1816 Sir Augustus West, *Deputy-Inspector of Hospitals to the Portuguese Forces; Lisbon.*

1828 John Whatley, M.D.

1840 Joseph Wickenden, *Birmingham.*

1824 *William Wickham, *Surgeon to the Winchester Hospital.*

1844 Frederick Wildbore, *High-street, Shoreditch.*

1837 G. A. F. Wilks, M.D., *Temple-walk, Matlock, Derbyshire.*

1840 C. J. B. Williams, M.D., F.R.S., *Holles-street.* C. 1849.

1829 Robert Willis, M.D., *Barnes.* L. 1838.

1831 *W. J. Wilson, *Surgeon to the Manchester Infirmary.*

1839 Erasmus Wilson, F.R.S., *Consulting Surgeon to the St. Pancras Infirmary;* 17, *Henrietta-street, Cavendish-square.*

1839 James Arthur Wilson, M.D., *Physician to St. George's Hospital; Dover-street.* C. 1846.

1825 Thomas A. Wise, *India.*

1841 George Leighton Wood, *Surgeon to the Bath Hospital; Queen-square, Bath.*

1848 William Wood, M.D., *Resident Medical Officer, Bethlem Hospital.*

1843 John Ward Woodfall, M.D,, *Physician to the Western Dispensary;* 33, *Davies-street, Berkeley-square.*

1847 Robert Woollaston, *Conduit-street, Westbourne-terrace.*

1833 Thomas Wormald, *Assistant-Surgeon to St. Bartholomew's Hospital; Bedford-row.* C. 1839.

1842 W. C. Worthington, *Surgeon to the Infirmary, Lowestoft, Suffolk.*

1848 Edward John Wright, *Kennington-row, Kennington.*

1835 John Wright, M.D., *Prince's-court, Westminster.*

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[It is particularly requested that any change of Title or Residence may be communicated to the Secretaries before the 1st August in each year, in order that the List may be made as correct as possible.]

## HONORARY FELLOWS.

ELECTED

1841 William Thomas Brande, F.R.S. L. and Ed., *Professor of Chemistry at the Royal Institution of Great Britain; Royal Mint, Tower-hill.*

1835 Sir David Brewster, K.H., LL.D., F.R.S. L. and Ed., &c., *Cor. Mem. Institute of France, &c.; Kingussie.*

1841 Robert Brown, D.C.L., F.R.S., *Vice-President of the Linnæan Society; British Museum.*

1835 The Very Rev. William Buckland, D.D., F.R.S., *Dean of Westminster.*

1847 Edwin Chadwick, *Barrister-at-law.*

1835 Michael Faraday, D.C.L., F.R.S., *Corr. Memb. Institute of France; Royal Institution.*

1841 Sir John Frederick William Herschel, Bart., D.C.L., F.R.S., *President of the Royal Astronomical Society; Somerset-House.*

1835 Sir William J. Hooker, LL.D., F.R.S. L. and Ed., *Royal Botanic Garden, Kew.*

1847 Richard Owen, F.R.S., *Corr. Memb. Institute of France; Hunterian Professor to, and Curator of the Museum of, the Royal College of Surgeons of England.*

1835 The Rev. A. Sedgwick, A.M., F.R.S., &c., *Woodwardian Lecturer, Cambridge.*

1841 The Rev. William Whewell, D.D., F.R.S., *Master of Trinity College, Cambridge.*

## FOREIGN HONORARY FELLOWS.

ELECTED

1841 G. Andral, M.D., *Professor in the Faculty of Medicine; Paris.*

1815 Paolo Assalini, M.D., *Professor of Surgery, and Chief Surgeon to the Military Hospital at Milan, &c.*

1835 Carl Johan Eckström, K.P.S. and W., *Physician to the King of Sweden, First Surgeon to the Seraphim Hospital, Stockholm.*

1835 W. J. Edwards, M.D., F.R.S., *Member of the Institute of France; Paris.*

1841 Christian Gottfried Ehrenberg, *Berlin.*

1835 Baron A. de Humboldt, *Member of the Institute of France, &c.; Berlin.*

1841 James Jackson, M.D., *Professor of Medicine in the University of Cambridge, Boston, U.S.*

1843 Baron Justus Liebig, M.D., F.R.S., *Professor of Chemistry in the University of Giessen, &c.*

1841 P. C. A. Louis, M.D., *Physician to the Hôtel-Dieu, Member of the Royal Academy of Medicine, &c.; Paris.*

1841 F. Magendie, M.D., *Member of the Institute; Physician to the Hospital of the Salpétrière; Paris.*

1847 Professor Matteucci, *University of Pisa.*

1841 Johann Müller, M.D., *Professor of Anatomy and Physiology, and Director of the Royal Anatomical Museum; Berlin.*

1835 J. C. Oersted, M.D., *Professor of Physics in the University of Copenhagen, &c. &c.*

1835 Professor Orfila, *Dean of the Faculty, &c. &c.; Paris.*

1841 Bartolomeo Panizza, M.D., *Pavia.*

1843 Philibert Joseph Roux, *Member of the French Institute; Surgeon in Chief of the Hôtel-Dieu; Professor in the Faculty of Medicine; Paris.*

1835 C. J. Timminck, *Director of the Museum of Natural History of the King of Holland; Amsterdam.*

1835 Friederich Tiedemann, M.D., *Professor of Anatomy and Physiology; Heidelberg.*

1841 John C. Warren, M.D., *Professor of Anatomy and Surgery in the University of Cambridge, Boston, U.S.*

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## ADVERTISEMENT.

The Council of the Royal Medical and Chirurgical Society deems it proper to state that the Society does not hold itself in any way responsible for the statements, reasoning, or opinions, set forth in the various papers which, on grounds of general merit, are thought worthy of being published in its Transactions.

ON THE EMPLOYMENT OF

# NITRATE OF POTASH

IN

# ACUTE RHEUMATISM,

WITH SUGGESTIONS FOR THE USE OF SALINE SOLUTIONS AS EXTERNAL APPLICATIONS IN LOCAL RHEUMATIC INFLAMMATION.

By W. R. BASHAM, M.D.,
PHYSICIAN TO THE WESTMINSTER HOSPITAL.

Received May 9th.—Read Nov. 14th, 1848.

There is no novelty in the administration of the nitrate of potash in acute rheumatism: and in bringing the subject forward, I desire most explicitly to state, that I am induced rather by the hope of determining the therapeutic value of this salt, and of examining its agency, than by the wish to claim any originality for its use. It has been largely and successfully employed by Dr. Brocklesby and others, whose observations and cases clearly establish the fact, that the system in acute inflammatory diseases will tolerate a very large amount of salines, with the utmost advantage to the duration and ultimate issue of the disease.

The analysis of the blood in inflammatory disorders (the true phlegmasiæ), has established the fact that there is a most remarkable deviation from the average proportion of the component parts of the blood; and that in these diseases, this deviation is constant, and uniformly in one direction, and consists of an excess of fibrine, with an absolute deficiency of the saline ingredients.

I have carefully analysed the blood in many cases of acute rheumatism. The three following exhibit the characteristic results observed in almost every case in which the blood was analysed for the purpose of determining the relative proportions of fibrine and saline ingredients :—

| | *In 1000 parts of blood* | |
|---|---|---|
| I. A man, æt. 30, a drayman, of vigorous habit, strong and muscular . . . | Fibrine 6·3 | Saline matters 7·4 |
| II. A man, æt. 45, coal-porter, tall and muscular . . | Fibrine 8· | Saline matters 8·93 |
| III. A man, æt. 27, clerk, of spare habit . . . . | Fibrine 7·2 | Saline matters 9·104 |
| Mean . . . . | 7·163 | 8·478 |

In each of these cases there was severe arthritic inflammation (redness, pain, and swelling in several joints) at the time when the blood was drawn.

I take the absolute deficiency of the saline ingredients of the blood in this disease as the basis of the explanation of the therapeutic action of the nitrate of potash. I assume that so long as the fibrine is in excess, and the salts both relatively and absolutely deficient, there is a liability to fibrinous exudation. That while this condition of hyperinosis continues, the worst consequences of inflammatory action are to be dreaded. That the treatment by nitrate of potash contributes to restore the balance of the saline ingredients, and to control the tendency to fibrinous deposition : and that, the progress of inflammatory action being thus retarded, time is gained for other remedies to effect the diminution of the excess of fibrine present in the blood, as well as the destruction of the rheumatic element.

There are many reasons why the nitrate of potash should be preferred for administration, before such salts as the chloride of sodium, sulphate of soda, phosphate of soda, carbonates of potash and soda, and others, which out of the body exercise a similar effect upon the coagulability of the fibrine.

The nitrate of potash, even in large doses, exerts but little effect on the secreting organs, except the skin and kidneys, and oftentimes is without any very obvious action on them. It does not purge as the sulphate and phosphate of soda : nor does it induce thirst as the chloride of sodium : nor disturb the digestive functions, a result often consequent on frequently repeated doses of the carbonates of potash or

soda, especially if these be administered in proportions large enough to affect the amount of the saline ingredients of the blood.

There is yet one other circumstance suggestive of the employment of the nitrate of potash, mentioned by Dr. Stevens (in a foot-note in 'Healthy and Diseased Properties of the Blood,' ed. 1832), viz. that it suspends the separation of the fibrine when taken internally. He says, "I know a case which occurred in America, where a person swallowed an ounce of nitre by mistake in place of Glauber's salts. The excitement which it produced was so great that the individual was bled. The blood which flowed from the vein was completely florid, and remained as fluid as if the nitre had been added out of the body."

Dr. Brocklesby* is the earliest authority for the use of large doses of nitre in the treatment of acute rheumatism. In a paper published by him, in a volume of 'Œconomical and Medical Observations,' 1758-63, after detailing the general treatment of the acute stage, he proceeds to state, that he enjoined for a diluting drink, smooth boiled water-gruel, in each quart of which he directed to be dissolved two drachms of nitre, with or without sugar. He states that he often prevailed on the soldiers to take ʒx or more of nitre in the twenty-four hours. And he adds, "as I have proposed nitre to be tried hereafter in quantities so much greater than have been usually prescribed, I will, as an apology for my presumption in the matter, appeal to experience. I am assured from numberless instances that in stout young men, by taking six hundred grains daily for four or five days successively, and diluting plentifully, plain nitre proves the most powerful and best sudorific in such complaints; and this quantity, or even more, may be retained in the stomach, and pass through the course of the circulation by only diluting profusely. My own stomach will, almost *at any time*, bear half an ounce of nitre or sometimes

* Œconomical and Medical Observations. By Dr. Brocklesby. In Two Parts. London, 1764. 8vo, pp. 116-18.

six drachms, dissolved in or diluted with three pints of smooth, well-boiled gruel; and this quantity swallowed in about half an hour or an hour proves to me almost an unfailing antidote in the beginning of any incidental fever from mere cold." (Op. cit. p. 121.)

Dr. Macbride (A Methodical Introduction to the Theory and Practice of Physic, 4to, 1772) speaking of sedatives, under which class he places nitrate of potash, says, "That in common practice nitre is seldom given in large enough quantities to do any remarkable service." In fever of the inflammatory species, and particularly in rheumatic fever, he considers nitre to be very efficacious when taken to the quantity of six, eight, or even ten drachms in the twenty-four hours. He mentions the necessity for free dilution, and further states that the patients who derived advantage from this course of treatment were of robust habit and in military hospitals. Although no reference is made to Dr. Brocklesby, there can be but little doubt but that this opinion was formed from the paper already quoted. Dr. Macbride further says, "Still later observations show that the stomach can bear considerable quantities of nitre without detriment (p. 273); under the head *Febris inflammatoria rheumatica*, he again states that large doses of nitre have been found to procure speedy relief (p. 335).

In more recent times, M. Martin Solon has employed the nitrate of potash in large doses, without its producing any unfavorable symptoms; only in very rare cases either operating on the bowels, or disturbing the stomach, results that are entirely conformable to my own experience. In a lecture published in the 'Bulletin de l'Académie Royale de Médecine,' tome ix, entitled "Considérations générales sur le traitement du rheumatisme articulaire aigu, par le nitrate de potasse à haute dose," he states that he has given the nitrate of potash in quantities varying from half an ounce to two ounces in the twenty-four hours, dissolved either in lemonade or in some pectoral ptisan.

The effects are minutely analysed and detailed in thirty-three cases.

On the circulation the effects were not very remarkable.

Sweating, in a marked degree, occurred in ten patients only. M. Solon does not think that this condition of the skin should be attributed to the salt of potash; for it is well known that sudoresis is ordinarily abundant in rheumatic fever. (p. 132 et seq.)

The urinary secretion was sensibly augmented only in five cases out of thirty-three. The nitrate was detected in the urine in every case in which it was sought.

On the digestive organs no effect was produced in twenty-four cases. In the nine others it produced nausea, vomiting, or looseness, symptoms which, however, rapidly passed away. In all, after the acute rheumatism had subsided, the appetite quickly returned, the digestive functions easily recovered their activity, and the general powers were not slow to return to their natural and healthy standard.

I commenced the use of the nitrate of potash in acute rheumatism in 1843, before the results of M. Martin Solon's experience had been published or were known to me; but strengthened by that gentleman's report, I have continued to employ it in large doses upon the principles which I have attempted to explain.

The amount of success which has followed this mode of treatment, whether it be considered in relation to the duration of the paroxysm, or the immunity from the more serious concomitants of this disease, has justified me in laying the results of my observations before the Fellows of this Society, and asking their concurrence to the therapeutic principle on which this plan of treatment is recommended.

The following is a summary of the effects observed in the use of nitrate of potash in acute rheumatism:

One, two, even three ounces of the nitrate, freely diluted, may be taken in the twenty-four hours in cases of acute rheumatism; and, in the majority of cases, without producing any obvious effect on the force or frequency of the pulse, the integrity of the digestive functions, the state of the abdominal organs, or even upon the quantity of urine excreted.

The amount of urine passed in the twenty-four hours, although seldom increased in quantity, always acquires a high specific gravity, 1·026—1·040, dependent in great measure on the presence of the nitrate of potash, which can always be detected in that fluid.

The internal use of the nitrate relieves, in a most marked manner, the swelling, heat, and pain of the joints in this disease; and this alleviation has, in certain cases, been observed to take place irrespectively of any other measures: in cases, for instance, in which neither opiates, calomel, antimony, purgatives, nor bloodletting were employed. There seems also to be a certain amount of exemption from cardiac complication, among those who have taken nitre largely in the earliest stage of the inflammatory attack; and exocardial and endocardial inflammation, when it is present, appears to become more manageable, and more easily brought under the influence of other remedies, when the nitre has been adjunctively employed. I have never seen the nitrate of potash, in large or small doses, produce either nausea or vomiting. In a few cases pinching or griping pains of the abdomen, with a few watery evacuations which have quickly ceased on discontinuing the salt, are the only unpleasant or undesirable effects that I have witnessed.

Free sudoresis is perhaps the most frequent apparent effect, but strong acid perspirations are so common in acute rheumatisms, independently of the employment of sudorifics, that it is impossible with certainty to refer this increased action of the skin in any case exclusively to the nitrate. I have watched the effect of the nitrate in many cases of acute rheumatism, in which large doses were employed without other remedies, and in which no very great increase in the perspirations was noticed, but in which, nevertheless, the symptoms of acute rheumatic inflammation were mitigated in a remarkably short time.

It cannot be doubted, then, that much larger quantities of saline matters can be tolerated by the system, without detriment or injury to any of the functions or organs of the

body, than has been generally believed; and the uniform beneficial results in numerous closely-watched cases, in which an obvious mitigation of symptoms was apparently obtained through the agency of the nitrate, appears to me to justify the classification of this salt, among the most certain and least hazardous remedial agents in acute rheumatism.

During the progress of these observations, it became a question of importance to determine if the nitrate of potash could be detected in the blood. As the action of the salt was so moderate upon the excreting functions, it was a fair inference that while the patient was taking the salt, there would be no great difficulty in demonstrating its presence in the blood.

The case was selected of a man thirty years of age, suffering from an attack of acute rheumatism (the third within four years), affecting the wrists, knees, and ankles. On admission, he was bled experimentally to four ounces, previous to being placed under the usual treatment. This quantity was received into two vessels, one for examining the physical characters of the blood, the other for analysis.

The first portion was remarkably cupped and buffed, presenting a firm, dense coagulum, with a concave layer of colourless fibrine, with perfect separation of the fibrine and red corpuscles from the serum.

The second portion was analysed, and gave in 1000 parts —fibrine 7·04, residual salts 9·41.

The nitrate of potash drink—ʒij of nitre in two quarts of cold water, flavoured with lemon-peel—was given in twenty-four hours, and continued for three days. He was again bled to four ounces, and the blood divided into two portions as before. The first portion set aside for coagulation, gave a firm coagulum; but was not cupped, and only presented a faint layer of colourless fibrine on the surface. The second portion gave, in 1000 parts—fibrine 5·53, residual salts 13·56; and amongst the saline residue nitrate of potash was detected.

He was again bled on the ninth day from admission, and

when the symptoms had mitigated; the nitrate of potash having been resumed for two days in consequence of a threatened remission.

The portion set aside for coagulation presented a perfectly separated clot, but there was no separation of the red corpuscles from the fibrine—no buffy superficial stratum. The portion analysed gave, in 1000 parts—fibrine 4·05, residual salts 14·9. Nitrate of potash was again detected.

From these analyses, it will be seen that the fibrine, in the nine days, fell from 7·04 successively to 5·53 and 4·05; while the residual salts gradually increased from 9·41 to 13·56 and at length to 14·9.

It is presumed, then, that while the internal use of the nitrate of potash assisted to restore the proportion of the saline constituents, the general constitutional treatment, calomel, opium, antimony, and colchicum, tended to lessen the excess of fibrine; and that by the cooperation of these several remedies the rheumatic condition became controlled, and the patient safely guided to convalescence.

I wish, therefore, most emphatically to state, that the employment of the nitrate of potash is not intended to supersede the use of other remedies when they are indicated. This saline plan of treatment is but an auxiliary to them; for I am quite aware, that although excess of fibrine and deficiency of salts have been proved to be the essential proximate condition of inflammatory disease, and although salines used internally may possess a certain influence and controlling power on the separation of the fibrine, yet in the majority of cases the saline medication cannot be supposed to cover and include all the purposes and objects of treatment. The various morbid conditions must be relieved by those remedies which general experience has proved to be most efficient; but in cooperation with them, most valuable aid may be derived from the nitrate of potash, and in no disease has its therapeutic influence been more apparent than in every form of acute rheumatism.

Physicians are generally of opinion that *external applications* in acute rheumatism are, for the most part, inefficient and unnecessary.

During the period that I have been engaged in observing the effects of nitrate of potash, more particularly in acute rheumatism, I have been led to an examination of the various modes by which these saline matters might be passed into the circulation. But it was not until the publication of Mr. Gulliver's edition of Hewson's Works, that my attention was fixed upon the probable relief that might be obtained to local acute rheumatic action, by the direct application of the saline matters to the skin. Mr. Gulliver says,* that the efficiency of saline medicines in inflammation probably depends on their correcting the disordered state of the blood, by preventing or destroying the aggregation of the corpuscles, and, consequently, their tendency to separate from the fibrine, and to accumulate in the minute vessels; and that hence the application of a solution of salt to inflamed parts, might prove a very useful and simple remedy.

Although not ignorant of the previous employment of the carbonates of potash and soda, or of the more recent empirical formula of brandy and salt, in the treatment of local rheumatic inflammation, I do not hesitate to admit that this passage, containing the enunciation of a principle so closely in accordance with what I believe to be the proper interpretation of the agency of salines employed internally, gave force to my previous opinions, and encouraged me to watch the effects of saline solutions externally applied to inflamed parts.

I could scarcely doubt, after witnessing the effects of the nitrate of potash taken internally in acute rheumatism, that the impregnation of an inflamed part with saline matters by absorption through the skin, would lessen the intensity, and cut short the inflammatory process; and often, if not always, prevent the formation of those impediments to motion, which constitute the more serious morbid effects of rheumatism affecting the joints.

* Sydenham Society's Edition of Hewson's Works, NOTE XXIII, p. 41.

My experiments have been made principally with the nitrate of potash, particularly in acute rheumatic inflammation.

In chronic arthritic affections I have frequently used the iodide of potassium externally, and with apparent advantage; and in a few cases of gout, the bibasic phosphate of soda has been employed with marked relief to the local paroxysm.

In collecting a series of observations on the effects of these agents, externally employed, many precautions became necessary to determine whether the treatment was only accidentally successful, or whether a remedial result could be clearly traced to the influence of absorbed saline matters. For it must not be forgotten that one of the most striking peculiarities of rheumatic inflammation is its erratic character, and that a part which shall be inflamed in the morning, will oftentimes spontaneously recover itself by the evening, the inflammatory action having developed itself elsewhere. In watching, therefore, the curative or remedial power of these saline applications in acute rheumatism, this fact is always kept in view. The result of my observations in numerous cases during the last two years, convinces me that a special remedial agency may justly be claimed for this epidermic saline mode of treatment.

When I first commenced the employment of these saline fomentations, the salt was brought in contact with the skin by means of light flannels, saturated with the saline solution, with which the limb was enveloped, the whole being covered with oiled silk to prevent evaporation. For the hands I have used worsted gloves. On the feet the foot of a worsted stocking, saturated with nitre, and covered with oiled silk.

But since the invention of Mr. Markwick's new epithem, I have found it so admirably adapted for my purpose, that now I never employ anything else. My method of employing it in acute rheumatism is as follows: if the hands, elbows, knees, or feet are the seat of inflammation, gloves or caps are made of the spongio-piline to fit these parts; if a greater extent of surface be involved, a portion of the spongio-piline is cut large enough to envelope the entire surface. The spongy

surface of the epithem is first moistened freely with water, and any superabundant fluid squeezed from it, so that the linen or bed of the patient may not be unnecessarily wetted. Nitrate of potash, or the salt to be employed in powder, is then freely and plentifully sprinkled over the moistened surface, or rubbed in to secure its solution, and the thorough impregnation of the epithem; it is then applied to the inflamed part, and lightly secured by a roller. Nothing further is required than once in about six hours to remoisten the spongy surface; fresh addition of nitre is never required if sufficient quantity has been used in the first instance; the salt in powder is hence better than a saturated solution, which nurses seldom succeed in making.

In numberless instances, by this simple treatment, I have witnessed the most palpable and evident relief to the local inflammation; and many rheumatic patients who have suffered from previous attacks of the disease, and have known relief to their local sufferings only through the instrumentality of the constitutional treatment, have declared that they marvelled at the speedy abatement of the pain, redness, and swelling, for they had never experienced such unexpected relief before.

As I am anxious to avoid the tedium of reports of cases, I propose in this place to state the result of the experiments adopted to test the efficiency of these saline applications in subduing local rheumatic inflammation. The object was to determine how far the relief obtained or apparent, could be attributed to the agency of warmth and moisture, and how much to the effects of the salt employed. Cases were selected in which both hands or two distant parts were in a state of rheumatic inflammation. Each hand was placed in a glove of spongio-piline, one was merely moistened with hot water, the other saturated with nitrate of potash. In every instance the local inflammation yielded to the saline remedy, while the other hand continued as if no local remedy had been employed. Eight different cases afforded exactly similar results. In five of them the local inflammation was in both hands; in two in both knees; and in one in the right elbow and left wrist.

In each case the part to which the salt was applied was relieved within twenty-four hours, the other parts continuing inflamed and painful, till they were subjected to a like treatment, notwithstanding the moist fomentations in which they were invested.

That the relief obtained in these cases could not justly be attributed to the constitutional treatment usually proceeding at the same time, is proved by the fact that during the earliest periods of the treatment, remission of the local symptoms was observed only in those parts to which the salt was applied.

The following case illustrates this point: A man, æt. 45, was placed under treatment, May 11, 1847, suffering from acute rheumatic inflammation of both knee-joints, the elbows and right wrist. These parts were red, swollen, and painful. He was ordered the usual treatment, but the elbows and right wrist were enveloped in the nitre fomentations by means of the spongio-piline. In twenty-four hours all redness had disappeared, and there was perfect mobility without pain, in both hands and elbows; but the inflamed state of the knees continued unmitigated: these were treated with the saline application, and the next day all swelling had disappeared; the joints could be moved without pain, though he could not stand from debility; but his convalescence proceeded uninterruptedly.

These, and many other cases, fully reported in the hospital ward books, illustrate the remedial agency of the nitrate of potash externally applied. In cases also of cardiac complication, very marked relief has been obtained by covering the præcordial region and anterior surface of the chest with the spongio-piline saturated with the salt. In several instances the irregular murmurs, particularly those of exocardial and pericardial disease, have disappeared even before the system had exhibited any indication of being under the influence of mercury.

ABSTRACT of Seventy-nine Cases of Acute Rheumatism, stating the Age, Employment, if complicated with Cardiac Disease or not, Treatment, and number of days before discharge.

Of 58 males—

10 suffered from cardiac symptoms before or after admission.

2 of whom died.

Of 21 females—

8 suffered from cardiac disease before or after admission.

1 of whom died.

Thus, amongst the 79 cases of acute rheumatism, there were

18 cases of cardiac disease and

3 deaths.

Of the 56 males who recovered—

The average duration of symptoms from admission to convalescence, was 31·10 days.

Of the 20 females who recovered—

The average duration of symptoms from admission to convalescence, 34·15 days.

| Date. | Initials and Age. | Employment. | Form of Rheumatism. P. indicates accompanying Fever. | Heart affected. Days after admission. | Treatment. | Duration of Symptoms. | |
|---|---|---|---|---|---|---|---|
| | | | | | | No. of days from admission to being placed on full diet. | No. of days from admission to discharge. |
| 1844. | | | | | | | |
| March | F. L., 28 | Bargeman | Acute arthritic, P. | | Purgatives; mercurials; Dover's powd. and nitre; guaiacum and bark | 25 | 36 |
| | J. T., 37 | Farrier | Acute arthritic, P. Hands and knees | | Purgatives; mercurials; Dover's powder and nitre; blisters; opiates | | 63 |
| April | H. P., 26 | Paperhanger | Acute arthritic, P. Feet, ankles, knees, and wrists | | Purgatives; mercurials; Dover's powder and nitre; bark | | 35 |
| | J. M., 26 | Stonemason | Acute muscular, P. | | Mercurials; purgatives; diaphoretics; Dover's powder and nitre | 10 | 22 |
| | J. C., 33 | Excavator | Acute muscular, P. | | Mercurials; purgatives; Dover's powder and nitre; bark | 9 | 18 |
| | D. W., 59 | Stone-sawyer | Acute arthritic, P. | | Purgatives; colchicum; Dover's powder and nitre | | 18 |
| | J. S., 20 | Brickmaker | Acute muscular, P. | | Purgatives; colchicum; Dover's powder and nitre | | 12 |
| | O. W., 30 | Stoker | Acute muscular, P. | | Mercurials; purgatives; Dover's powder and nitre | | 21 |
| June | J. G., 24 | Painter | Acute arthritic, P. Local inflammation yielded 4th day from admission. Copious sudoresis | Fourth day. Systolic murmur. | Nitrate of potash, ℥j xxiv hours; sudoresis; cupping in regione cordis | 11 | 20 |

| | | | | | | |
|---|---|---|---|---|---|---|
| July | J. T., 39 | Agricultural labourer | Acute arthritic, P. Local inflammation yielded 5th day; relapse 11th | Nitrate of potash, ℥j xxiv hours; sudoresis; Dover's powd. and nitre; purg. and bark | 14 | 22 |
| | J. S., 49 | Labourer in lead works | Acute arthritic, P. Local inflammation yielded 3d day | Nitrate of potash produced griping and laxness of bowels | | 23 |
| | H. F., 34 | Artisan—goldsmith | Acute arthritic, A. P. Supervening on chronic | Dover's powd. and nitre | | 33 |
| Aug. | J. G., 33 | Farrier | Acute arthritic, P. 3 days ill. Local inflammation yielded 2d day; relapse 6th day; cured 9th | Nitrate of potash, ℥j xxiv hours; copious sudoresis and diuresis | | 52 |
| Oct. | G. T., 25 | Carpenter | Acute arthritic, P. Local inflammation yielded 4th day; relapse 9th; yielded 2d day | Mercurial purgatives; colchicum; nitrate of potash; sudoresis; Dover's powder | | 35 |
| Oct. | T. C., 25 | Waterman | Acute arthritic, P. Yielded 5th day | Mercurial purgatives; nitrate of potash; Dover's powd. and nitre; bark | | 41 |
| | J. M., 30 | Painter | Chronic muscular, A. P. | Purgatives; colchicum; Dover's powder and nitre; guaiacum | | 30 |
| Oct. | W. H., 47 | Coal-porter | Acute muscular, P. | Mercurial purgatives; Dover's powder and nitre; warm-baths | 11 | 33 |
| Nov. | W. B., 28 | Excavator | Acute arthritic, P. | Nitrate of potash; no obvious effect except mitigation. Dover's powder and nitre | | 25 |

| Date. | Initials and Age. | Employment. | Form of Rheumatism. P. indicates accompanying Fever. | Heart affected. Days after admission. | Treatment. | Duration of Symptoms. No. of days from admission to being placed on full diet. | Duration of Symptoms. No. of days from admission to discharge. |
|---|---|---|---|---|---|---|---|
| 1845. Jan. 7 | J. P., 20 | Draper's assistant | Acute arthritic, P. Yielded 5th day | Carditis on admission. 14th day, aggravation of cardiac symptoms. Præcordial dullness, but no murmurs or discharge | Mercurials and colchicum; cupping; purges. Calomel and opium; slight salivation. Cupping in regione cordis. Dover's powder and nitre; bark and nitric acid | 28 | 40 |
| — | S. J., 35 | Artisan — cabinet-maker | Acute arthritic, P. Yielded 6th day | | Calomel and opium; Dover's powder and nitre; bark | 17 | 30 |
| — 15 | J. W., 22 | Fishmonger | Acute arthritic, P. | | Calomel and antimony; colchicum; Dover's powder and nitre; bark | | 34 |
| — 16 | H. B., 37 | Bricklayer | Acute muscular, P. | | Mercurial purgatives; hot baths; colchicum; Dover's powder and nitre | | 40 |
| — 20 | T. W., 36 | Porter | Acute muscular, P. | | Purgatives; warm baths; colchicum; Dover's powder and nitre | | 15 |
| — 21 | D. R., 25 | Labourer | Acute arthritic, P. Yielded 6th day; relapse 14th day | | Calomel, antimony, and opium; Dover's powder and nitre; colchicum; baths; bark | 20 | 28 |
| — 27 | J. H., 22 | Cooper | Acute arthritic, P. Yielded 3d day | | Dover's powd. and nitre; colchicum; baths | | 22 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Feb. 20 | J. H. | Cooper | Readmitted: relapse 3 days after discharge | Treatment repeated; bark | | 33 |
| — 25 | J. M., 27 | Currier | Acute arthritic, P. | Mercurial purgatives; Dover's powder and nitre; colchicum; salines; bark | | 50 |
| | S. W., 36 | Butcher | Acute arthritic, P. Yielded 8th day. | Mercurial purgatives; Dover's powder and nitre; colchicum; salines; bark | | 25 |
| March 9 | J. R., 18 | Stonemason | Acute arthritic, P. | Purgatives; baths; Dover's powd. and nitre; bark | 23 | 42 |
| June 17 | F. J., 26 | Smith | Acute arthritic, P. | Calomel, antimony, and opium; Dover's powd. and nitre; nitrate of potash drink; bark | | 24 |
| — | W. B., 46 | Sawyer | Acute arthritic, P. | Calomel; purgatives; Dover's powder and nitre; colchicum; saline draughts | | 42 |
| Nov. 19 | J. J., 23 | | Acute arthritic, P. | Mercurial purgatives; colchicum; salines; Dover's powder and nitre | | 34 |
| Dec. 2 | J. W., 32 | Labourer | Acute muscular, P. | Baths; purgatives; colchicum; salines; Dover's powder and nitre | | 23 |
| — 23 | F. G., 48 | Plasterer | Acute muscular, P. | Baths; mercurial purgatives; colchicum; salines; Dover's powder and nitre | 80 | 28 |

| Date. | Initials and Age. | Employment. | Form of Rheumatism. P. indicates accompanying Fever. | Heart affected. Days after admission. | Treatment. | Duration of Symptoms. | |
|---|---|---|---|---|---|---|---|
| | | | | | | No. of days from admission to being placed on full diet. | No. of days from admission to discharge. |
| 1846. Jan. 16 | G. P., 24 | Carman to a distiller—of free habits | Acute arthritic, P. Arthritic symptoms yielded 6th day; cardiac very obstinate and persistent | Carditis on admission. Præcordial effusion; systolic murmur | Calomel, antimony, and opium; nitrate of potash drink; colchicum; salines; cupping—many times. Ptyalism, without obvious diminution of cardiac symptoms. Discharged with heart disease; systolic murmur; increased impulse | | 34 |
| — 15 | J. H., 18 | Cabman | Acute arthritic, P. Arthritic inflammation obstinate to 8th day | Pericarditis 6th day from admission; free from cardiac symptoms on discharge | Calomel, antimony, and opium; nitrate of potash ℥j, in 24 hours; colchicum; salines; cupping | | 18 |
| — 20 | W. C., 42 | Labourer | Acute arthritic, P. Remarkable low type of fever. Gastro-enteric fever epidemic at this time | Pericarditis 6th day from admis.; rough fibrinous deposit over the exocardial surface; Peyerian glands inflamed and ulcerated | Calomel and opium; colchicum; salines; terebinthinate enemata; nitrate of potash; Dover's powd.; bark and quinine; cupping | | Died 13th day |
| Feb. 12 | C. W., 24 | | Acute arthritic, P. | Cardiac symptoms on admission; pericardial effusion; no murmur; muffled sounds | Calomel and opium; cupping; colchicum; salines; nitrate of potash ℥j, in 24 hours; Dover's powder and nitre | | 14 |

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|---|---|---|---|---|---|---|---|
| Feb. 23 | G. M., 24 | Porter | Acute arthritic, slight P. | | Baths; mercurials; Dover's powd. and nitre; colchicum; salines; bark | | 41 |
| April 8 | J. H., 47 | Baker | Acute arthritic. Arthritic symptoms very obstinate. | Carditis 4th day; exocardial murmur and palpitation; no morbid sound on discharge | Calomel; purgatives; baths; colchicum; salines; Dover's powd. and nitre; cupping; ptyalism; bark and quinine | 36 | 52 |
| | G. R., 20 | Footman (mother rheumatic) | Acute arthritic, P. | Carditis on admission; exocardial murmur and palpitation | Calomel and opium; colchicum; salines; Dover's powder; quinine and iron | 15 | 30 |
| — 28 | T. C., 57 | Stableman (4th attack) | Acute arthritic, P., complicated with chronic bronchitis. Pneumonia supervened 5th day | Carditis on admission; exocardial and endocardial murmurs | Dover's powd. and nitre; expectorants; blisters to chest; calomel and opium; cupping inter scapulas | | Died 7th day |
| May 19 | J. S., 18 | French-polisher | Acute arthritic, P. | | Calomel and antimony; opium; Dover's powd. and nitre; bark | | 16 |
| June 26 | H. S., 45 | Labourer | Acute arthritic, P. Two weeks' duration | | Calomel and Dover's powder; baths; colchicum; salines; Dover's powd. and nitre; bark | 21 | 30 |
| July 8 | H. S., 25 | Fish-salesman | Acute arthritic, P. | | Calomel and opium; baths; colchicum; salines; Dover's powd. and nitre; bark | | 20 |
| — 30 | D. B., 60 | | Acute arthritic, P. | | Calomel and opium; colchicum; salines; Dover's powd. and nitre | | 12 |

| Date. | Initials and Age. | Employment. | Form of Rheumatism. P. indicates accompanying Fever. | Heart affected. Days after admission. | Treatment. | Duration of Symptoms. No. of days from admission to being placed on full diet. | Duration of Symptoms. No. of days from admission to discharge. |
|---|---|---|---|---|---|---|---|
| 1846. | | | | | | | |
| Aug. 11 | H. S. | | Acute arthritic, P. | | Calomel; purgatives; calomel and opium; colchicum; salines; Dover's powder and nitre | | 13 |
| Oct. 14 | W. B., 39 | | Acute arthritic, P. | | Nitrate of potash; colchicum; salines; Dover's powd. and nitre; bark and quinine | | 60 |
| Nov. 3 | M. T., 45 | Labourer | Acute arthritic, P. | Cardiac symptoms from admission; præcordial dullness and muffled sounds; no cardiac symptoms on discharge | Calomel and opium; colchicum; salines; blisters to præcordia; nitrate of potash drink; Dover's powder; quinine | 24 | 35 |
| — 10 | J. T. | | Acute muscular, P. | | Calomel and Dover's powder; colchicum; salines; warm baths; Dover's powder and nitre | | 16 |
| 1847. | | | | | | | |
| Jan. 27 | D. M., 46 | House-painter | Acute arthritic, P. | | Calomel; purgatives; antimony and opium; colchicum; salines; Dover's powder and nitre | | 28 |
| Feb. 17 | J. R., 28 | Coalheaver | Acute arthritic, P. Frequent relapses. | | Nitrate of potash; Dover's powd. and nitre; colchicum; salines; bark | 14 | 70 |

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|---|---|---|---|---|---|
| Mar. 19 | J. S., 20 | Sailor | Acute arthritic, P. | Calomel and opium; colchicum; salines; nitrate of potash drink; Dover's powder and nitre; bark | 52 |
| May 11 | S. S., 45 | Butcher | Acute arthritic, P. External saline application. Yielded 2d day | Mercurial purgatives; colchicum; salines; Dover's powd. and nitre; nitre externally | 352 |
| July 6 | H. L. 38 | Labourer | Acute arthritic, P. | Calomel and Dover's powder; colchicum; salines; Dover's powder and nitre | 48 |
| Aug. 3 | E. L., 28 | Coachman | Acute arthritic, P. | Calomel; purgatives; Dover's powder and nitre; colchicum; salines | 16 |
| Oct. 19 | W. H., 23 | French-polisher | Acute arthritic, P. Saline application to right hand relieved paroxysms in 12 hours. No relapse | Mercurial purgatives; colchicum; salines; Dover's powder and nitre; external saline application | 31 |
| — 21 | E. C., 30 | Tailor | Acute arthritic, P. Frequent relapses. Saline application. Paroxysm yielded each time in 12-20 hours to saline | Calomel and opium; nitrate of potash drink for 7 days; Dover's powder and nitre; saline fomentations; bled 3 times experimentally for analyses | 22 Hadulcerated sore throat, which retarded his convalescence. |
| 1844. April | Lucy F., 23 | | Acute arthritic, P. Chronic thickening of two fingers remained | Calomel and opium; purgative salines; Dover's powder and nitre; leeches to hands; quinine | 34 |

| Date. | Name and Age. | Employment. | Form of Rheumatism. P. indicates accompanying Fever. | Heart affected. Days after admission. | Treatment. | Duration of Symptoms. | |
|---|---|---|---|---|---|---|---|
| | | | | | | No. of days from admission to being placed on full diet. | No. of days from admission to discharge. |
| 1844. | | | | | | | |
| April 23 | Ellen W. | Servant | Acute arthritic, P. | | Calomel and opium; colchicum; salines; Dover's powder and nitre; blister to knee | | 16 |
| Oct. | Susan A., 23 | Unmarried—in service | Acute arthritic, P. Three relapses of local inflammation; rheumatic sclerotitis 61st day | Symptoms of pericarditis 30th day | Baths; colchicum; salines; Dover's powd. and nitre; calomel and opium; quinine; cupping to temple; salivation slight | | 79 |
| Dec. 19 | Frances D., 28 | Unmarried—in service | Acute arthritic, P. Ankles and knees | | Calomel and Dover's powder; baths; colchicum; salines; Dover's powd. and nitre; quinine | | 38 |
| 1845. | | | | | | | |
| Feb. | Anne J., 30 | In service | Acute arthritic, P. Hands and feet | | Colchicum; salines; mercurials; Dover's powder and nitre | | 24 |
| June 27 | Cath. F., 30 | Married | Acute arthritic, P. | | Purgatives; colchicum; salines; nitrate of potash; Dover's powd.; bark | | 40 |
| Aug. 19 | Anne S., 22 | In service (father very gouty) | Acute muscular, P. Obstinate diarrhœa supervened 24th day, which protracted her convalescence | | Purgatives; colchicum; salines; nitrate of potash; Dover's powd.; bark | | 53 |

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|---|---|---|---|---|---|---|
| Oct. 1 | Sarah M., 22 | In service | Acute arthritic, P. Second attack within seven months | Cardiac symptoms on admis.; palpitation and obscure sounds; no heart symptoms on discharge | Cupping and leeching; cardia; nitrate of potash; mercurials; Dover's powder; colchicum; salines; bark | 36 |
| — | Eliza Shipton, 13 | In service | Acute arthritic, P. Hands, elbows, and ankles | Cardiac symptoms on admission; rubbing murmur; systolic murmur; præcordial dullness; on discharge systolic murmur persistent | Calomel, antimony, and opium; nitrate of potash; Dover's powd.; cupping and leeching; quinine and iron | 42 |
| — 30 | Louisa M., 22 | In service | Acute muscular, P. | | Baths; colchicum; salines; Dover's powd. and nitre; bark | 25 |
| 1846. March | Eliza D., 21 | In service | Acute arthritic, P. Hands and feet | Cardiac symptoms on adm.; rubbing murmur; systolic murmur; palpitation; cardiac symptoms all relieved on dis. | Nitrate of potash ʒj; calomel and opium; Dover's powd.; ptyalism; cupping reg. cordis; colchicum; salines; bark | 29 |
| 1847. Jan. 14 | Jane G., 25 | Married—in service | Acute arthritic, P. Knees, ankles, and wrist | | Calomel and Dover's powder; colchicum; salines; Dover's powd. and nitre; quinine | 26 |
| Feb. 17 | Eliza Shipton, 14 (vide supra) | | Acute arthritic, P. Hands, knees, ankles, great tendons of præcordia | Cardiac symptoms on admis.; tumultuous action; systolic murmur; exocardial murmur; copious deposit of lymph on exocardial surface; vegetation on aortic valves | Calomel, antimony, and opium; cupping; blisters; nitrate of potash and Dover's powder; salivation could not be established | Died 14th day |

| Date. | Name and Age. | Employment. | Form of Rheumatism. P. indicates accompanying Fever. | Heart affected. Days after admission. | Treatment. | Duration of Symptoms. | |
|---|---|---|---|---|---|---|---|
| | | | | | | No. of days from admission to being placed on full diet. | No. of days from admission to discharge. |
| 1847. | | | | | | | |
| April 26 | Maria M., 20 | In service | Acute arthritic, P. Frequent relapses. Spongio-piline with nitre relieved each paroxysm in 12 hours | Cardiac symptoms on admission; systolic murmur; palpitation; no adventitious murmur on discharge | Calomel and opium; cupping several times; nitrate of potash; Dover's powder; nitrate of potash externally to joint and pericardium; quinine | | 53 |
| May 19 | E. R., 50 | Married | Acute arthritic, P. Supervening on chronic arthritis | | Mercurials; Dover's powd. & nitre; nitrate of potash externally; mobility of hands and feet free, although chronic; thickening not much diminished | | 23 |
| Sept. 7 | Mary Anne Cheeseborough, 19 | In service | Acute arthritic, P. Knuckles and wrists | Carditis on admission; first attack nine months since, with carditis; heart's action turbulent; præcordial dullness; systolic and diastolic sounds confounded; sharp hammer-like ring, with diastole; much pulmonary distress, rhonchi, and moist crepitation; on discharge resp. condition natural; no palpitation; slight systolic murmur | Calomel, antimony, and opium; cupping; chest enveloped in spongiopil. and nitre; slight ptyalism; bark, &c. | | 33 |

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|---|---|---|---|---|---|---|---|
| Sept. 14 | Jane Thomas, 16 | | Acute arthritic, P. Knuckles. Has had chorea; symptoms of it during convalescence | | Warm baths; Dover's powder and calomel; nitre drink; spongio-pil. and nitre | 14 | 28 |
| Nov. 5 | Martha Wright, 34 | Dressmaker | Acute arthritic, P. Hands and knees. | | Warm baths; Dover's powder and nitre; nitre drink; nitre fomentations | 8 | 20 |
| — 11 | Emma Hughes, 18 | Servant | Acute arthritic, P. Ankles, hands, and wrists | | Warm baths; colchicum: salines; Dover's powder and nitre; nitre drink; nitre fomentations | 8 | 28 |
| — 16 | Eliza Raggett, 34 | Married | Acute arthritic, P. Right knee, ankle, and hand | | Calomel; Dover's powder and nitre; nitre drink; nitre fomentations; bark | 12 | 21 |
| Dec. 7 | Emma Pegoe, 21 | Servant. | Acute arthritic, P. Hands, knees, and ankles. Yielded 14 hours; mobility complete 3d day | Faint exocardial murmur 3d day; disappeared 5th day | Calomel, antimony, and opium; colchicum; salines; nitre drink; nitre fomentations; Dover's powder and nitre | 23 | 35 |

56 males—average duration of symptoms 31·10 days
20 females „ „ 34·15 days

76

3 cases died—2 males and 1 female

Making together 79 cases.

ON THE CAUSES

OF THE

# ENDEMIC PUERPERAL FEVER OF VIENNA.

By C. H. F. ROUTH, M.D.,

Communicated by Dr. MURPHY.

Received May 29th.—Read Nov. 28th, 1848.

The author of the following remarks having had his attention painfully called to two or three unfortunate cases of puerperal fever, prior to his visit to the Continent, had subsequently an opportunity, in walking the hospitals of Paris and Vienna, of obtaining some more extended information relative to the causes of this disease. Believing that the facts he has observed are sufficiently important, he ventures to call to them the attention of the profession. These remarks, however, must be regarded as *applying especially* to Vienna, although it is believed that similar causes are brought into operation in other countries, and might as effectively be combated.

A short explanation of the manner in which labours are conducted in the Vienna Hospital, and the system of clinical instruction carried on, is a necessary prelude to a clear understanding of the question.

There are three lying-in departments in the general hospital. The first, a secret department, to which strangers are not admitted, and which, therefore requires no further comment. The remaining two are open to medical investigation. For the sake of clearness, we shall speak of one of these as the *first division*, and of the other as the *second division*.

The *first division* is for the instruction of medical men and midwives. The *second division* for *midwives exclusively*.

In the former there are about twenty or thirty medical men, and eight midwives. These midwives, in addition, perform other menial duties. There are besides about sixteen nurses employed in the various wards to attend upon the patients. The wards in this division are eight in number: they are large and airy.

In the *second division,* or that *exclusively* intended for midwives, their number is about twenty-eight, but in other respects the arrangements are entirely similar to those of the first division, with this exception, however, which it is important to bear in mind, that the wards are neither *so large nor so airy.*

The following table exhibits the average number of deliveries and the amount of mortality per month:

| Number of deliveries in each division. | First Division—Mortality. | | | | Second Division—Mortality. | | | |
|---|---|---|---|---|---|---|---|---|
| | Ordinary. | | Occasional. | | Ordinary. | | Occasional. | |
| | Actual number of deaths. | Proportion to deliveries. | Actual number of deaths. | Proportion to deliveries. | Actual number of deaths. | Proportion to deliveries. | Actual number of deaths. | Proportion to deliveries. |
| From 250 — 300 mean 275 | about 30 | 1 in 9·16 | about 70 | 1 in 3·92 | about 7 to 9 mean 8 | 1 in 34·37 | about 3 | 1 in 91·66 |

In one particular year, indeed, out of some 3000 cases delivered, about 500 died in the first division. While in the second division, out of the same number delivered, the deaths frequently did not exceed forty. These numbers are only approximative, as for obvious reasons the statistics are kept secret.

The clinical instruction is conducted on this wise. In the *first division* the management of labours is thus regulated: four of the midwives are reserved for the night duty, and four for the day duty, and each of these must, in her turn, deliver a woman; but one is moreover called upon every eight days to act as the "*Journalistin,*" i. e. to watch and examine every case in labour admitted during a period of twenty-four hours. Two gentlemen (sometimes only one) are called upon to exercise, conjointly with the midwife in

question, a similar function. In the discharge of this duty, they are allowed to repeat these examinations as frequently as they deem it necessary. But this is not all. When the membranes are ruptured, the midwife, according to order, is called to deliver the woman, and one gentleman (formerly there were two) is also in attendance to witness the delivery. This is what is called "*taking a tour*," and these parties are again allowed to make examinations, if they think fit. Again, the professor during his morning visit, and the assistant during the evening visit, not unfrequently make or allow examinations to be made by the gentlemen present, whenever a case of interest presents itself. Practically, therefore, every woman admitted must needs be examined by some five different persons at least, and this number may be doubled or even trebled. The practical instruction is also given in a private course, where the operations are performed upon the *dead body of some female.*

The clinical instruction in the second division is conducted on precisely the same general plan, and the examinations made are as frequent, if not more so; but the *practical instruction* is given and the operations performed upon the *leather phantom*, and *not* upon the *dead body.* This last fact it is important to remember. These details may appear somewhat tedious, but they bear too much upon the sequel to have been omitted.

The frightful mortality in the first division, as compared with the second division, became at last so notorious, that many females refused to become patients in the former, and public opinion compelled the Austrian government to make it a subject of inquiry. The commission appointed for that purpose came to the conclusion that the prevalence of the fever was due to the excess of students in attendance, and their number in consequence was reduced from forty to about thirty. The same disproportion in the mortality of the two divisions, however, still continued, so that it was evident to all that the true cause had not been discovered.

This singular difference between the two divisions could not fail to occupy a large share of the attention of the pro-

fession, the more so, as analogous examples were traced, or were supposed to have been found, in other countries. Thus in Prague, where two divisions also existed, it was said that the mortality was even greater than in Vienna, in the division for medical men; while in that for midwives exclusively, it was but small. In Strasburg, likewise, the author was credibly informed by Dr. Wrieger, a practitioner of that city, where there are also two divisions, that the same difference of mortality was observed, so much so, as to make it sometimes imperative to close the division for medical men, for the purpose of disinfecting the wards; while in that for midwives puerperal fever was very rare. The proverbial mortality in the "Hôpital Clinique" of Paris, where medical men and students only are in attendance, was supposed to afford melancholy proof of the baneful results consequent on the attendance of male obstetricians. The first and most natural presumption seemed to be that the fever was excited in the first instance by the rough manipulations of men-midwives, these setting up inflammation about the generative organs, which, by extension upwards, gave rise to puerperal fever; while the manipulations of the female hand being more gentle, no such unfortunate complication followed in the cases they attended. A very little reflection and a positive example to the contrary at once disproved this supposition.

1st. As Dr. Semelweiss (to whom I shall more particularly allude immediately) remarks, if it were so, it is evident that, in all cases of difficult or instrumental labour, puerperal fever would result, whereas this is by no means the general rule.

2d. Male obstetricians are, for the most part, persons whose anatomical and physiological knowledge of the parts concerned in labour exceeds that of midwives, and to whom therefore a diagnosis, by being so much *more easily* and *speedily made,* does not necessarily require so much manipulation, so that one of the chief causes of inflammation, and consequently of puerperal fever, is thus avoided.

3d. This fever is comparatively rare in the *private practice* of accoucheurs.

4th and lastly. The positive example to the contrary is afforded us by the Hôpital de la Maternité, at Paris, where the ordinary labours are exclusively conducted by *midwives*, and where the disease is of *very frequent* occurrence.

We must, therefore, conclude that there is no evidence to show that the roughness of the manipulations of male obstetricians is the cause of puerperal fever.

*Contagion.*—At a period when the occurrence of so many diseases is ascribed to this influence, it is proper to consider how far it may be capable of exciting puerperal fever. That the contact of *fomites*, the direct or indirect communication with persons affected with puerperal fever; that some influence carried, either by the patient herself or her attendants, from other contagious diseases, such as erysipelas, typhus, and other low fevers, has in many cases given rise to puerperal fever among lying-in patients, is a fact that admits of no doubt. Drs. Copland, Collins, Rigby, Lee, Gooch, Ferguson, Blackmore, Piddie, Mr. Storr, and a host of other writers, have related several cases of this kind. Again, Dr. E. Murphy, of London, has especially called attention to the late epidemic of Dublin, in which it was clearly proved, that when the medical man in attendance on a puerperal fever case visited another female in labour, and delivered her in the same clothes in which he had attended the first, he almost invariably communicated the fever to her. This fact was peculiarly exemplified in the case of a German student, who was following the midwifery practice in and out of the hospital, and being rather neglectful in his habits, and not changing his clothes as desired, *invariably* communicated the fever to all the cases he attended, whereas with others, who were more careful in this respect, no such unfavorable results occurred.

The author was aware of these facts, and made particular inquiries on the subject in Vienna; but whether it was due to the peculiar variety of the Vienna fever or not, the information he obtained was altogether nugatory in regard to this view. At first, indeed, it did appear probable that it might be induced by the contagion of typhus, which is known

to be one of the most common and fatal diseases in Vienna. He could not, however, hear of a single case of puerperal fever that could be traced satisfactorily to this contagion, nor conversely of a single case of typhus occurring in any of the nurses or attendants of the cases affected with puerperal fever.

2d. As to its propagation more particularly by the clothes of the attendants—the very method of tuition in Vienna disproves this. The medical men and midwives in the first division are continually by the bedside of the puerperal fever cases, and generally in the same dress. Indeed the author, amongst many others, kept a particular dress for doing duty in that hospital, and he never had reason to believe that he had been the medium of contagion. Moreover, he has negative evidence to the contrary, i. e. of having frequently made a careful medical examination of a patient affected with most malignant puerperal fever, and remained by the bedside for several minutes together, and subsequently examined some ordinary case in the ward, and yet the disease was not communicated. In like manner, he has frequently remarked that the patients on each side a puerperal fever case have entirely escaped the disease. Such facts he is quite aware cannot be regarded as very positive evidence; but negative evidence frequently repeated, assumes a certain positive value; and it is here strengthened by the facts observed in the second division. As it has already been stated, the same regulations are enforced in the second division, and the same favorable conditions for contagion are present, with this difference only, that partly from these regulations being more stringent, and partly from the very habits of women, the midwives are more frequently and longer at the bedside. Were contagion then the cause, we should expect that puerperal fever would be of more frequent occurrence in the second than in the first division, which is the reverse of the fact.

3dly. The Strasburg Hospital seems to disprove the contagious nature of the disease. Here it has generally been observed (and that usually every two years), that the

fever becomes so pestilential, as to necessitate the closure of the establishment for the purpose of disinfecting the wards. The females who at the time may be affected with puerperal fever are then removed to the division for midwives. Experience has shown that in such instances the disease does not spread. This statement is made upon the authority of Dr. Wrieger, of Strasburg.

4thly. Allusion has been already made to the eight midwives and sixteen nurses, in the first division at Vienna. Now, the former must, by law, be married women; and it is believed the same rule applies to the nurses. At any rate, it frequently happens that they become pregnant. Here we have persons in constant attendance upon the puerperal fever cases. Most, if not all, of these are usually confined in the hospital; the only difference in their case being, that they are generally delivered by one of the *head-nurses, apart in a private ward,* and that the *medical men do not assist in the confinement.* Now, although we have the means of contagion present here in an eminent degree, the author was, on careful inquiry, unable to hear of a single case where one of the nurses or midwives had puerperal fever.

5thly and lastly. The only fact which would appear to give some countenance to the view of contagion is the following: It often occurred that the infant of the female affected with puerperal fever died at the outset of the mother's illness; and, in such cases, a post-mortem examination of the infant proved death invariably to have resulted from peritonitis. The fact is important, when taken in connexion with the occurrence of peritonitis in husbands exposed to the contagion of puerperal fever from their wives, as noticed by Mr. Storr. But here the evidence is not sufficiently clear to allow us to attribute the result to mere contagion. As there are good grounds for believing that the lochia in ordinary puerperal fever is intensely poisonous in most cases, as also puerperal abscesses, &c., and that there is every reason to believe that the entire mass of the blood is poisoned in such cases; that, on the other hand, the child is very easily affected by any morbid qualities of the mother's

milk (which, of all the secretions, is, perhaps, that most easily modified by the state of the mother), it seems more correct to conclude that the milk in this case becomes an animal poison to the child, the peculiar effect of which (in the same manner as cantharides may produce an inflammation of the urinary passages) is to produce peritonitis. It is not thought, therefore, that, in the facts adduced, there is sufficient evidence to conclude that, either by the contact of *fomites*, or communication of the sick with infected persons, directly or indirectly, the Vienna puerperal fever is contagious.

*Infection.*—Infection properly so called, that "peculiar morbid atmospheric influence which extends beyond the range of personal communication," through the respiratory organs perhaps, and which is *distinct* from *epidemic* influences, as well as from true *contagion*,—this influence, the author does not believe, could be unequivocally made out to exist in the Vienna Hospital. Many of the facts already adduced in speaking of contagion go far to disprove infection also; such as the non-occurrence of puerperal fever among the nurses. Moreover, the circumstances known to favour infection, i. e. want of cleanliness and ventilation in the wards, are absent. The patients are delivered in a ward especially set aside for that purpose. Moreover, on removal clean sheets are always given. The lying-in chamber is partly cleaned every morning, thoroughly every three or four days, and even the very straw mattresses are changed; and so it is with every ward. It may reasonably therefore be said that the greatest cleanliness prevails throughout the department; and generally the moment a patient becomes really sick with malignant puerperal fever, she is at once removed into a separate apartment. But, secondly, we have a strong argument against infection exerting so powerful an influence, in this *fact*, that if these regulations were inefficient, the disease ought to be infinitely more frequent and fatal in the division for midwives, where the wards are altogether less roomy and less airy. These considerations, it is believed, warrant the conclusion, that infection cannot be rightly

looked upon as the cause which originates the puerperal fever of Vienna.

*Direct application of poisonous matter, or inoculation.*—Dr. Blackman, of Edinburgh, it is believed, was the first who distinctly stated that it was probable the medical attendant might communicate the disease, by retaining a portion of poison, *subter ungues,* which he subsequently directly applied on making an examination *per vaginam.** Though this fact may have been suspected by many others, yet, so far as the author is aware, he believes that it was first clearly enunciated by Dr. Semelweiss, the distinguished assistant-physician of the first obstetric division at Vienna. Reasoning upon some of the facts before noticed, Dr. Semelweiss was led to infer that the real source of the infection was to be found in the *hands of the medical men in attendance contaminated with cadaveric poisons.* These gentlemen having all more or less diligently attended the numerous autopsies in the dead-house, and frequently handled, as a matter of course, the specimens of disease found. Now, Dr. Semelweiss remarks that, after handling dead matter, the hands, however well washed, still retain a *peculiarly fetid cadaveric odour,* which does not disappear for several hours, and sometimes not till the next day. The very presence of this smell implies the retention on the surface, or imbibition by the epidermis of a quantity, however small, of cadaveric matter. Again, when it is remembered that in many dead-houses, from the absence of a *nail-brush,* frequently of *soap* and *warm* water, the hands cannot be properly washed, it is exceedingly probable that a portion of this cadaveric matter is retained under the nails; and it is very easy to understand how, on examination made subsequently *per vaginam,* this poison should be directly and effectively applied. In this manner he supposed the disease was so frequently generated in the wards of the first division, and explained the sanitary condition of the second division, since the midwives made no autopsies, and worked on the phantom, and so did not get their hands infected with cadaveric matter.

* Prov. Med. and Surg. Journal, No. xxv, 1845.

But Dr. Semelweiss did more. He acted upon this supposition. He recommended all students frequenting the division not to handle dead matter, or if they did, he forbad them to make any examination till the following day. In the second place, he directed all the students who attended the practice of the division to wash their hands in a *solution of chlorine prior to and after every examination* made on the living subject. The result of these precautionary measures was that the *number of deaths at once fell to seven per month*, or the usual average of the second division. This is a speaking fact. It explains the difference of mortality of the two divisions at Strasburg. Here, likewise, although the medical men in attendance do not dissect, yet they perform operations upon the dead body and autopsies, whereas the midwives do not. The difference of the mortality at Prague may also be so accounted for. The apparent exception of the Maternité at Paris is also explained, since the midwives in that institution do dissect and perform the autopsies; and with regard to the Hôpital Clinque at Paris, the known zeal of the French students for anatomical inquiries, coupled with their general indifference in the selection of bodies for dissection, will also fully account for the frightful frequency of puerperal fever in that hospital.

Even in Great Britain many of the cases reported and ascribed to contagion from typhus or erysipelas, may in reality have been caused by the direct inoculation of poisonous secretions derived from gangrenous wounds in such cases, with which the hands of the medical attendants, who had previously dressed these wounds, had been accidentally infected.* This view of the case derives some additional confirmation, from the similarity or analogy of the symptoms of puerperal fever with those arising from a poisoned dissection wound.

This poisonous matter may be absorbed in several ways. Through the absorption of the mucous membrane of the vagina, or more directly through trivial wounds about the

* Dr. Peddie's case, Prov. Med. and Surg. Journal, No. xx, 1846; Mr. Storr's case, ibid., No. clxvi, 1843.

generative organs, such as the lacerated fourchette in primiparæ, lacerations of the cervix or os uteri, or the extended inner surface of the uterus deprived of its decidua and placenta; all these parts, both from the general nervous shock and the removal of local congestion, being in a highly favorable condition for absorption.

The feverish symptoms usually occurred on the second or third day after labour; yet cases were noticed where they did not occur before the seventh and even fourteenth days. Generally, the fatal result did not take place before the fourth or fifth day after seizure, but sometimes it occurred as early as twenty-four hours after the first appearance of the fever. A diarrhœa generally preceded the attack, but sometimes, though rarely, the patient was costive. Then followed general languor, and a feeling of weakness, rigors; and the pulse was usually from 120 to 130 in the minute, sometimes, however, as high as 160, very weak. The patient's countenance assumed a peculiarly anxious expression; there was pain generally about the uterus, either in the organ itself or in the peritoneum about it. As these symptoms increased in intensity, heat set in, with dry tongue, loss of appetite, thirst, &c. The *lochia was very seldom affected* either in *quantity or appearance.* The lacteal secretion continued *undiminished, and apparently unaltered.* Indeed, if at the outset of the disease the skin was observed to be rather drier than usual, this symptom did not last; the perspiration becoming subsequently more copious than otherwise, and continuing so up to the hour of dissolution. Large violet maculæ occurred sometimes in the extremities. In some cases the intellect was affected, but this was of *very rare occurrence,* as it usually continued clear up to a very few minutes before death. The more marked local symptoms were those of peritonitis, which gradually increased in intensity. The pain generally disappeared an hour before death; the face gradually assuming a more sallowish, yellow, and cadaveric expression.

The post-mortem appearances were generally the following:—Arachnitis in a slight degree. Occasionally endocar-

ditis, very generally pericarditis. Almost always some pleuritis or pneumonia. *Liver and spleen healthy.* Extensive peritonitis, with plastic adhesions, and sero-purulent fluid in the abdominal cavity. The uterus was much enlarged, much softened, and tearing very readily, containing pus in the veins, especially in the neighbourhood of the fallopian tubes. The inner surface was of a yellow-whitish colour, with here and there plastic exudation. Sometimes the lymphatics proceeding along the spine were beaded in appearance, containing pus. Where death occurred early, there was generally only some muddy-looking fluid in the abdominal cavity, with endometritis, and occasionally pus in the uterine veins. Sometimes the case was one of pure peritonitis, the uterus being scarcely affected. The body was very prone to decomposition; its external surface mottled, especially at the extremities; the superficial veins very apparent, of a dull bluish-red colour. The blood generally liquid, and very dark, not coagulating after exposure.

The fever was not equally intense in all cases. This might be due to the idiosyncrasy of the female, or to the variety of the poison. Indeed, Dr. Semelweiss thought he had observed that the inoculation of cadaveric matter from cases of typhus, erysipelas, and puerperal fever was most fatal.

The author, therefore (although he is perfectly willing to admit that the fever, like all other fevers, may be very much modified by epidemic influences), thinks himself justified in concluding—

In the first place, that—1. The puerperal fever of Vienna may be looked upon as an endemic fever.

2. That it is produced by the direct application of poisonous cadaveric matters, introduced by the hands of the male obstetricians in attendance.

3. That the cadaveric matters derived from the bodies of persons dead of typhus, erysipelas, puerperal or other low fevers, are peculiarly dangerous; but that there is no evidence to show that any ordinary cadaveric matters may not produce it.

4. That it does not appear to be either contagious or infectious.

And, in the second place, as the precautionary measures adopted by Dr. Semelweiss have produced such satisfactory results, that—

1. Accoucheurs should as much as possible avoid making autopsies, and all contact with cadaveric matter.

2. They should never attend any woman in labour in clothes which may possibly have been infected; but, *especially* if compelled to handle cadaveric matters, or other poisonous secretions from living persons, should, prior to any examination made *per vaginam*, not be satisfied with washing their hands most carefully, and subsequently greasing them, but also make use of a solution of chlorine, to disinfect the hand from any poisonous matters with which it may have become contaminated, before they presume to enter the lying-in bedchamber.

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Postscript: April 29, 1849.—Accounts which reached me through Dr. Tumanhof, in June last, or six months after my departure from Vienna, confirmed in every respect the favorable results obtained from the adoption of Dr. Semelweiss's precautionary measures. And in a letter since received from Dr. Golling, Secundarius to the hospital, bearing date December 24th, 1848, the following passage occurs: "Dr. Semelweiss and all the medical men of the hospital are delighted with the admirable success of his system." The origin of the Vienna puerperal fever seems therefore to be fully established.

May 21, 1849.—In a letter received from Dr. Semelweiss a few days since, dated March 4th, 1849, the following statistics are given: In one division (the first division)—

| | | *Females.* | | |
|---|---|---|---|---|
| In 1846 there were admitted | | 3354 | and there died | 459 |
| 1847 | „ | 3375 | „ | 176 |
| 1848 | „ | 3356 | „ | 45 |

It was not till the end of May, 1847, however, that the chlorinated lotions were employed. Thus, you see that the mortality has diminished in an extraordinary manner.

Professor Michaelis, of Kiel (Schleswig-Holstein), writes me that, from the time he has employed chlorinated lotions, which extends over a space of several months, he has only lost one female; though, prior to that period, the mortality was so great, that he was considering whether it would not be right to close the hospital altogether.

CASE OF

# CYSTICERCUS CELLULOSÆ

IN THE

## ANTERIOR CHAMBER OF THE HUMAN EYE.

By WILLIAM MACKENZIE, M.D.,

SURGEON-OCULIST IN SCOTLAND IN ORDINARY TO HER MAJESTY THE QUEEN.

Received Oct. 24th.—Read Nov. 28th, 1848.

Elizabeth Gordon, aged 16 years, applied at the Glasgow Eye Infirmary, on the 26th September, 1848, on account of obscurity of vision in her left eye. In the anterior chamber, close in front of the pupil, which, in a bright light, it completely covered, lay a spherical body, about one eighth of an inch in diameter, semi-transparent, and having a good deal the appearance, at first view, of the nucleus of the crystalline lens. On observing it for some little time it was evident that it was a vesicle, changing occasionally its form and position, and protruding by times from its lower edge an opake white filament. The part first mentioned was, in fact, the tail-vesicle of a cysticercus cellulosæ, and the latter its body and head. The head was seen to be occasionally thrust down nearly to the bottom of the anterior chamber, and then drawn up completely into the tail-vesicle.

The patient stated, that about the middle of June the left eye had been affected with inflammation, which continued for about three weeks, and was removed after the application of a poultice of rotten apples, immediately after which the hydatid was noticed.

She seemed in good health, but stated that she had never been robust, and when a child had been troubled with ascarides and lumbrici.

Objects placed in a direct line before the eye, or below it, she saw very indistinctly; but when the light was moderated, the upper part of the pupil expanded past the obstruction of the hydatid, leaving the two lower thirds still covered, and then she saw distinctly objects held above the level of the eye.

From the 1st till the 14th of October, the hydatid was an object of curiosity to numerous visitors, both lay and medical.

Sometimes it was found with its head pointed directly towards the cornea, sometimes with it turned back into the pupil. In both positions the opake white colour of the body contrasted strikingly with the semi-pellucid tail-vesicle. I tried to make it revolve in the anterior chamber, by leaning back the patient's head, but did not succeed. Its movements were observed to be most lively in the morning, or when the patient was warm. When the patient became chilled, it moved little, and retracted its body into the tail-vesicle. The extensibility of its body, neck, and four lateral suckers, was very great, so that it not only reached completely to the bottom of the anterior chamber, but bent its head to one or other side for a considerable way between the circumference of the iris and that of the cornea. With a lens of half-inch focus the suckers were seen elongated and retracted by turns. The rostellum, or middle member of the head, was also distinct, but the corona of claws which surrounds this part could not be made out.

In general the patient made no complaint of pain. Of the motions of the hydatid she was quite unconscious. Once or twice she complained of pain in the eye, but I attributed this rather to the frequent microscopic examinations to which the eye had been subjected, than to the presence of the cysticercus.

Seeing, however, that vision was so much obstructed by it, and aware that its presence in the eye would ultimately bring on disorganization of the textures with which it was in contact, it was resolved that it should be extracted.

On the 14th of October, the patient lying supine, and her

left eyelid being retracted by the fingers of the assistant and the operator, I made a puncture with Beer's pyramidal knife, at the temporal edge of the cornea, to the extent of $\frac{3}{20}$ of an inch. A little of the aqueous humour escaping as I withdrew the knife, the tail-vesicle of the hydatid became flattened and much expanded between the iris and cornea. I immediately passed Schlagintweit's hook through the wound, seized the body of the hydatid with it, and easily withdrew the animal entire. The iris protruded somewhat through the wound, but was readily reduced by friction through the medium of the upper eyelid, so that the pupil resumed its natural form and place. The patient was sent to bed, and ordered to keep her eyes shut, and the left eye covered with a wet rag.

The hydatid was received into a teaspoonful of warm blood-serum, but this probably restrained its movements, which grew more lively on its being transferred into tepid water. It continued to move for fully forty minutes after being extracted from the eye, but very feebly for the latter half of that time. Viewed through the compound microscope, the transparent corona of claws surrounding the rostellum was seen distinctly. The corpuscles scattered over its neck, and which are supposed to be ova, were very distinct, as well as the four lateral suckers, which appeared as if covered, each of them, with a minute enchased cornea, darkened with pigmentous matter.

Next day the patient felt quite well; the eye appeared natural, and she said she saw as well with it as the other. No reaction followed, and she was dismissed on the 21st October.

As this is only the fifth instance of a cysticercus cellulosæ in the anterior chamber of the human eye, the particulars of which have been recorded, I may perhaps be allowed to add a few remarks on it.

In the first place, there can be little doubt that the attack of ophthalmia in June, immediately preceding the appearance of the hydatid, was owing to the development of its ovum in one of the blood-vessels of the iris or choroid;

and that the inflammation ceased suddenly as soon as the hydatid dropped into the anterior chamber, where it lived at its ease, amply furnished with sustenance from the aqueous humour, and unrestrained by any external cyst, such as that which surrounds the same entozoon when lodged among the muscles.

2d. As it was resolved to extract the hydatid by an incision through the cornea, I tried no application to the eye with the view of killing it, such as the vapour of hydrocyanic acid, lest the entozoon being killed might excite inflammation, which it evidently had not commenced to do since assuming its place in the aqueous humour; and lest the very means used to despatch it might cause irritation of the eye, and thereby render the operation more hazardous.

3d. Forewarned by what happened in Neumann's case, I refrained also from dilating the pupil by belladonna. In that case the cysticercus slipped into the dilated pupil, and remaining there, caused such irritation that the pupil could not by any further application of belladonna be dilated sufficiently to set the hydatid free from its embrace. Under these circumstances, a needle was passed through the cornea, and the cysticercus depressed. By this means the pupil was freed, and the pain removed. But the crystalline lens must have been sacrificed, and what is worse, on the third day severe inflammation set in, and the eyeball suppurated.*

4th. In operating on Elizabeth Gordon I imitated the plan followed by Dr. Schott, in a case related by Dr. D. W. Soemmerring,† the only difference being that he used a pair of forceps for extracting the hydatid, while I employed Schlagintweit's hook, an instrument admirably suited by the smallness of its size, the certainty of its gripe, and the guard upon its point, for being introduced into the interior of the eye, seizing any of the membranous textures, such as the iris or the crystalline capsule, and extracting them without catching in the wound. It is by far the best instrument, for instance, for Freytag's operation of extracting a secondary

* Rust's Magazin, vol. xxxiii.

† Oken's Isis for 1830.

capsular cataract through a puncture of the sclerotica.* Forceps are always objectionable as an instrument to be used within the eye, owing to the considerable incision required to allow the expansion of their blades before they can be made to seize anything.

5th. Had the patient been younger and not very staid, I should have put her under the influence of chloroform before proceeding to the operation. The result of Mr. Logan's case, operated on by Dr. Robertson, shows the danger to be apprehended from restlessness of the patient under similar circumstances. An incision of the cornea having been made in that case, no persuasion or threats could induce the patient, a girl of seven years of age, again to open the eye; she became perfectly quite unruly, and the muscles compressed the eye so powerfully, that the crystalline lens was forced out and the hydatid ruptured.†

6th. Some of my friends hinted that I was rather precipitate in operating on Elizabeth Gordon, and that I might safely have allowed so curious an object as a living cysticercus in the eye to remain for a time, for the examination of those who felt an interest in the natural as well as pathological history of the entozoa. A reference to Mr. Canton's case will serve as my vindication. The eye in this case inflamed in consequence of the presence of the hydatid, the cornea became semi-opaque and vascular, so that the iris was hid from view, the diameter and prominence of the cornea were abnormally increased, and the patient, a boy about ten years of age, suffered almost constant pain and lost flesh during the progress of these symptoms. The cysticercus was extracted, but the eye was not thereby saved from further disorganization. Twice did the cornea again require to be opened, to give exit to the disorganized contents of the eyeball.‡ It should be added, that the patient applied too late to afford an opportunity of saving the eye.

* J. H. Freytag de Catarrhacta, in Haller's Disp. Chir., vol. ii.

† Jones's Manual of the Principles and Practice of Ophthalmic Medicine and Surgery, p. 216. London, 1847.

‡ Lancet, July 22d, 1848.

On the whole, then, I am disposed to say that, by a puncture of the cornea rather than a free incision, and extraction with a small hook, the point of which is guarded, rather than a pair of forceps, and this done early, not delayed till disorganizing inflammation is excited, the cysticercus cellulosæ, when it occurs in the anterior chamber of the human eye, may be pronounced *jure optimo cæsus.*

ON THE

# MINUTE ANATOMY

OF

# THE LUNG OF THE BIRD,

CONSIDERED CHIEFLY IN RELATION TO THE STRUCTURES WITH WHICH THE AIR IS IN CONTACT WHILST TRAVERSING THE ULTIMATE SUBDIVISIONS OF THE AIR-PASSAGES.

By G. RAINEY, M.R.C.S.

DEMONSTRATOR OF ANATOMY AT ST. THOMAS'S HOSPITAL.

COMMUNICATED BY DR. TODD.

Received Oct. 10th.—Read Nov. 28th, 1848.

A DIFFERENCE in structure between the membrane lining the bronchial tubes, and that lining the air-cells of the lungs, has long since been inferred and insisted upon by Dr. Addison and others purely from pathological considerations; but, prior to the communication of a paper of mine, upon the Minute Structure of the Lungs, to the Royal Medical and Surgical Society in 1845, I believe no direct proof that there is a decided difference in the structure of these parts had been advanced; that is, it had not been shown that the membrane and epithelium which line the bronchial tubes are not present also in the air-cells.

Notwithstanding the facts adduced in my paper, and the facility which the examination of lungs, recently and properly injected, affords, in determining the precise structure of the walls of the air-cells, and in proving, so far as a negative question is susceptible of proof, that they are destitute of a lining of epithelium, it is still maintained by some authors that the air-cells are lined with ciliated epithelium. The demonstration of this supposed fact has been attempted by filling the air-passages with tallow or size, and then submitting the lung thus treated, and the casts taken from the air-cells, to examination with the microscope. I may observe that all the ramifications of the bronchial tubes have a very complete lining of ciliated epithelium, which, by

such a mode of preparation, might easily have been detached and broken up, and fragments of it forced into the air-cells, hence such a mode of procedure seems ill calculated to determine a point of so much delicacy. I am ready to admit that corpuscles of various kinds may occasionally be found in the air-cells, but these have not the most remote resemblance either in their quantity or manner of arrangement to a lining of epithelium, especially of that kind which is called ciliated epithelium. Mr. Addison was the first who described an epithelium lining the air-cells, which he states to be in the form of round nucleated scales, with from one to fifteen or more nuclei observable in a single scale. (Philosophical Transactions, 1842, Part ii, p. 162.) It is very evident from this description that Mr. Addison must have mistaken the nuclei in the coat of the capillaries for an epithelium, an error which it is very easy to commit in examining the uninjected lungs, and which error can only be corrected by comparing the lungs uninjected with those in which the capillaries have been filled with injection. I have frequently seen the curve formed by a capillary projecting beyond the free border of the pulmonary membrane, where it forms a communication with an adjoining cell, presenting so much the appearance of a delicate epithelium that, had I not more than once seen a vessel in a similar situation in the injected lung, I might have mistaken it for a portion of epithelium lining an air-cell, and considered that the air-cells have a lining, if not of ciliated, yet of pavement, epithelium, as some anatomists of the present day imagine.

Notwithstanding, however, all that has yet been advanced on both sides concerning the presence or absence of an epithelial lining to the air-cells, this subject will probably be considered by many as undecided, and as requiring further confirmation. I am convinced this circumstance, even in the present state of the discussion, is not due to a deficiency of evidence on the negative side of the question, but to the difficulty which there always is in supporting a negative position against a positive one; the arguments in defence of the former being necessarily indirect and rational, and

frequently deducible only from laborious observations and difficult experiments, whilst mere assertions, resting sometimes only upon the credit of the person who makes them, are all that is necessary to support the latter. But fortunately this is one of those questions which, if it cannot be determined in one class of animals, admits of being decided by an examination of the structure of the lungs in another class; furnishing an example of the advantage of comparative anatomy in leading to a clear comprehension of the structure of organs, which, in their pathological and physiological interest, must be classed among the most important in the body: and it is with this view that I have extended my inquiry to the minute anatomy of the lung of the bird and inferior mammals, to be considered chiefly in relation to the structures with which the air is in contact whilst traversing the ultimate subdivisions of the air-passages.

The respiratory apparatus in birds, as in mammals, consists of trachea, bronchi, intercellular passages and air-cells. The trachea is made up of a series of rings, incomplete posteriorly, and connected together by an extremely elastic membrane: besides this membrane there are, in mammals, fibres connecting these cartilages, said to be muscular but of the unstriped kind. In birds, the trachea is almost entirely surrounded by muscular fibres, but of the striped variety. These fibres are strongest along the sides and posterior part of the trachea; they do not extend entirely to the median line behind, but in front a thin layer goes completely across from one side of it to the other; they extend along the whole length of the trachea, but are not continued upon the bronchial tubes. The bronchial tubes in birds are membranous passages surrounded by the air-cells, traversing the lungs in various directions, and communicating freely with one another; their calibre is much more uniform than are the bronchial tubes of mammals, and the intercellular passages are very small, and given off at right angles with their axis, chiefly from their sides, instead of being continued from their extremities as in mammals. These peculiarities are rendered necessary in birds, by the additional function

which these tubes have to perform, of conducting air from the lungs into the air-sacs and interior of the bones. The bronchial tubes in birds are lined by a distinct fibrous membrane, similar in appearance to that lining these passages in mammals; and at those parts of the tube from which the intercellular passages proceed this membrane is perforated, so that the bronchial membrane, like that in the human lung, does not extend further than the bronchial tubes. (See Plate, in which these perforations are exhibited.) The intercellular passages, as before observed, are small and very numerous, and proceed from the entire circumference of the bronchial tubes, at right angles with their axis. They very soon lose themselves, becoming more and more minute; among the air-cells they have no apparent membranous lining. The air-cells are situated all around the bronchial tubes, filling up the interval between them and the spaces which separate the lobules; the interlobular fissures appearing, in the uninjected lung, to be merely the cellular walls of these passages. These cells, consisting almost entirely of blood-vessels, present a reddish colour; hence birds have been said by some physiologists to have fleshy lungs. Although I have called these air-cells, because they receive and retain the inspired air, and therefore correspond in office to the small cavities which in mammals have received this name, yet I may observe that the ultimate form of the air-passages in birds is not that of cells as in the human lung. The capillaries, instead of being connected together by a membrane, and placed several of them upon the same plane, and these planes of vessels so disposed towards one another as to divide the interior of the lung into square or polyhedral spaces, form by their frequent anastomoses upon different planes, and without any membrane connecting them excepting those capillaries which are situated nearest to the surface of the lobules, a kind of dense solid plexus, with no other separation between its vessels than the open areolæ or meshes of the plexus which communicate freely through the whole of a lobule. If a lung be examined by the microscope immediately after having been injected, globules of air

are seen occupying the spaces between the capillaries. These globules are of various sizes, according to the dimensions of the areola in which they are situated. Some of those areolæ are exquisitely minute; they are generally smaller than the diameter of the capillaries by which they are inclosed, their diameter averaging about $\frac{1}{9600}$ of an inch. These several structures have an investment of cellular tissue more or less complete, by which an entire lung is divided into lobules, as in the lung of the mammal. These lobules are generally distinguished in the bird by their great length, giving the exterior of the lung a convoluted appearance, not unlike that presented by the surface of the cerebrum. Besides the vascular and membranous constituents of the lung already described, there is another, namely, the epithelium, which requires to be noticed. It was stated that the membrane lining the bronchial tubes does not extend into the intercellular passages, but terminates by a distinct circular border at the commencement of these passages from the tubes, giving the membrane in this situation a cribriform appearance. Neither does the ciliated epithelium lining the bronchial tubes extend into the intercellular passages, and from thence into the air-cells, or rather air-spaces, but it ceases where the bronchial membrane terminates. In the mammal, but especially in man, in whom the air-cells are very large, the fact of their having no epithelial lining can only be proved by a careful examination of the parts with the microscope, and therefore with no other means than these of deciding this question, it might always remain *sub judice*, so long as persons are found who are more ready to confide in the assertions of others than submit to the pains and difficulty of examining the point for themselves. The evidence furnished by a reference to the anatomy of the bird's lung is, however, of a more satisfactory kind, and more susceptible of a rational proof. It has been observed that the atmospheric air which enters the bird's lungs, is not received into regularly formed cells, but that it passes into minute interstices between the vessels, the average diameter of which is about $\frac{1}{9600}$ of an inch, and some are even smaller.

Now each epithelial cell which lines the bronchial tubes of a pigeon, I found by measurement to be $\frac{1}{800}$ of an inch in length, and about $\frac{1}{3300}$ of an inch in breadth; so that a comparison of these dimensions shows that the air-cells in the bird are several times smaller than the individual particles of epithelium, which are considered by some to line them; hence the idea of the ultimate subdivision of the air-passages in birds having a lining of ciliated epithelium, is seen not only to be incorrect but absurd.

Anatomically considered, the mere areolæ formed by the anastomoses of the pulmonary capillaries can scarcely be looked upon as air-cells; but, physiologically regarded, they are as much entitled to be considered as such as are the large regularly-formed polyhedral spaces in the human lung, or even the saccules in the lung of the reptile.

Although the ultimate subdivisions of the air-passages in birds are so extremely minute, yet it is in the examination of the lungs of this class of animals that we see a respiratory organ in its greatest state of simplicity, and in which the process of respiration can be best studied. It is most obvious, on a careful inspection of the well-injected lungs of a bird, that the air, in traversing the minutest subdivisions of the air-tubes, passes close to the vessels themselves, these forming the immediate boundary of these subdivisions. Hence it is clear, that the aeration of the blood in the lung of the bird is carried on without the necessity either of ciliated epithelium or basement membrane, but simply by the action of the inspired air upon the blood in the vessels, with no other membrane intervening but their coat.

That this simplicity in the process of respiration is not confined to birds I shall now endeavour to prove by some observations upon the lungs of those mammals whose respiratory function is more energetic than that of man, but less so than that of birds.

However the organs of respiration in the different classes of animals may differ in their anatomical characters, there can be, I think, no question but that the principle upon which they act is the same in all; and if the simple exposure

of the blood in the capillaries to the action of the air be all that is required for the aeration of the blood in that class in which this function is performed with the greatest activity, one would think that additional structures cannot be essentially necessary to aid the action of the air upon the blood in the vessels of those animals in which the process of respiration is less active. The correctness of these inferences is shown by a comparison of the structure of the lungs of several mammals with the lungs of birds.

If the lung of the bird be compared with that of man, the contrast is so striking that the two scarcely seem to have been designed to perform the same function; but there are many links placed between these two extremes, by the examination of which it is seen that a gradually increasing resemblance in structure to the lung of the bird exists in different animals, in proportion as the activity of their respiration approaches to that of birds. In the lung of the kangaroo, especially in those parts remote from the surface, the air-cells are very small, and disposed with the greatest irregularity; the pulmonary membrane is also proportionally imperfect, being perforated in many places opposite to the areolæ of the plexuses, so as to admit the air passing through them to come into contact with the coats of the vessels, as in the lung of the bird. In this mammal the minuteness of the air-cells is such, that many are too small to have a lining of ciliated epithelium without being completely filled by it. In the lung of the rat and mouse the air-cells are still more minute, and certainly many of them are not of a sufficient size to receive even an individual particle of ciliated epithelium.* The air-cells are disposed with the same kind of irregularity, and the pulmonary membrane is deficient, as in the lung of the kangaroo. In the lung of the hare the air-cells are very small, but perhaps not so much so as in the preceding mammals. The lung of the rabbit resembles that of the hare, but its air-cells are rather larger. In the lung of the dog the air-cells are

* The cells of ciliated epithelium in the rat and the mouse are almost as large as in man.

larger than in the rabbit, but still in the more central parts of the lung they are very minute, too minute, indeed, to be capable of having a lining of ciliated epithelium, without being wholly unfitted for the purposes of respiration. In the monkey the air-cells are large, and resemble those in the human lung. It may be observed that the dimensions of the air-cells bear no proportion to the size of an animal; in the lung of the sheep and the ox, they are upon the whole about the same size, and very minute in both, so that if they had a lining of ciliated epithelium, certainly no space would be afforded for the air; and these organs, in the place of possessing that degree of lightness by which they are so universally known, could not fail to have a density little inferior to that of liver. If even the examination be continued to the lungs of the reptile, it will be found that the sacculi in the lung of the frog (the analogue of the well-formed air-cells of the human lung, and the minute areolæ of the lung of the bird) are not completely lined by ciliated epithelium.

In the numerous examinations which I have made of the lungs of the frog, I do not recollect having seen the epithelium anywhere but upon those ramifying cylinders in which are lodged the trunks and ramifications of the larger blood-vessels. (See Appendix.) In the human lung, the partitions by which the air-cells are separated from one another consist of a single plexus of vessels, connected by a distinct membrane, whilst the sacculi or air-cells in the lung of the reptile are separated by a similar plexus folded upon itself; and therefore they have between them a septum composed of two layers of vessels. In birds it has been shown that the capillaries have no distinct membrane by which they are held together, the extreme frequency of their anastomoses upon different planes being sufficient for that purpose, together with the support which they receive from a strong membrane, and the ribs externally, and the lining of the bronchial tubes internally. Besides, their fixed position renders their more minute parts less liable to displacement than in the lung of mammals. From a general

review of these facts and observations, it will be seen that the blood in the pulmonary capillaries of the three classes of animals here mentioned, the reptile, the mammal, and the bird, is exposed in different degrees to the action of the air. In the reptile, one layer of vessels being applied on its outer side to the vessels of the adjoining cell, the blood can only be acted upon on one side of these vessels, that next the sacculi. In man, only one layer of vessels being situated in the two cells between which it is placed, the blood on both sides of these capillaries will be exposed to the influence of the air; but still these vessels, on the side where they are connected together by the pulmonary membrane, are unfavorably placed for receiving the full effect of the air in the contiguous air-cells. Lastly, in birds, the capillaries having no membrane to connect them together (excepting those which are situated nearest to the surface of a lobule), the air is allowed to pass freely between and all around them, and thus the most advantageous position is afforded for enabling the blood in their interior to expose the largest possible surface to the action of the inspired air. With the exception of these differences, which cannot affect the principle either vital or physical upon which the lungs act, the structure of these organs is the same in these three classes of animals: hence, as it has been shown to be impossible that the aeration of the blood can be effected by a ciliated epithelium in the ultimate subdivision of the air-passages in the bird and some of the inferior mammals, it must be obvious that it is not essential for this process in man.

Besides the gradual manner in which we see the lungs of animals approach, in their structure, the lung of the bird, which must be admitted to possess the most perfect respiratory organ, by the deficiency and imperfection of that part of the lung, viz. the pulmonary membrane, which can only answer a mechanical purpose, and which has been shown to interfere with, rather than aid, the great design of the respiratory apparatus, the aeration of the blood, it seems probable the office of the epithelium also is merely mechanical, and

that the essential and only true organs of respiration, or rather of the aeration of the blood, are the pulmonary capillaries with the blood within them.

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## APPENDIX.

It is worthy of remark, that in certain crustaceous animals, as, for instance, in the crab, the branchial lamellæ are totally destitute of ciliated epithelium. In this animal, the water is wafted through the chamber containing the branchiæ by three pairs of long and slender organs, studded with hairs like a brush, and connected to the roots of the foot-jaws by a moveable articulation. These organs, called flabella, when in action have a regular and rapid motion, very similar to that of vibratile cilia, as seen through the microscope, in the mussel. Each flabellum is moved by a muscle destined expressly for the purpose, and the hairs upon it seem to have no motion excepting that communicated to them by the entire organ.

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## EXPLANATION OF PLATE I.

Fig. I. Represents a section of the Lung of a Fowl,—*a a*, a large bronchial tube extending through the whole length of this section; *b b*, the openings of smaller bronchial tubes proceeding from the inferior part of it; *c*, the horizontal section of a bronchial tube proceeding from the side of the larger tube *a*, and after a short course dividing into two branches of equal size, one passing onwards in the direction of the original tube, the other descending into the

Fig. 1

Fig. 4

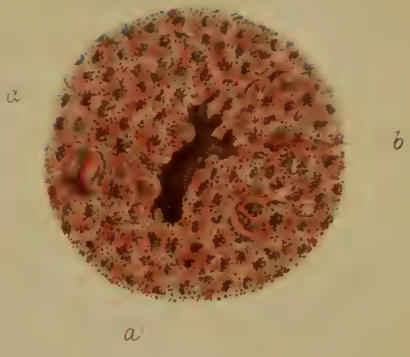



Fig. 2

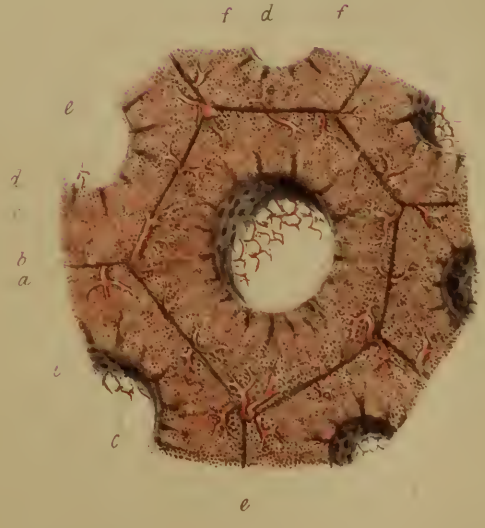
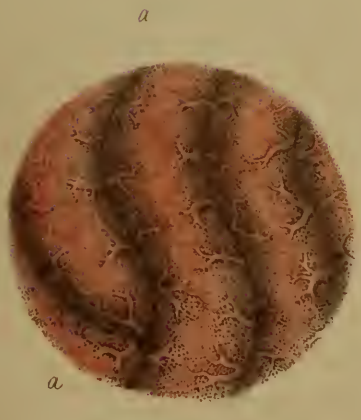



Fig. 3.

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substance of the lobule; *d d*, the openings of other bronchial tubes, cut obliquely with respect to their axis, coming up from other larger tubes; *e e*, the spaces between adjoining lobules containing the trunks of the pulmonary blood-vessels, and loose areolar tissue, and corresponding to the interlobular fissures in the lung of the mammal; *f f*, the depressions on the inner surface of the bronchial tubes *a* and *b*, from which the intercellular passages (or the last subdivisions of the air-passages) commence. These depressions are surrounded by circular openings through the membranous lining of the tube from which they proceed.

Fig. 2. Represents a section of the same lung through a bronchial tube, almost at right angles to its axis, under a higher magnifying power than in the preceding figure.—*a*, a bronchial tube cut a little obliquely with respect to its axis, corresponding to the tube *c* or *d* in figure 1; *b*, exhibits the membrane lining the tube *a*, and the delicate capillaries situated in its substance, and forming circles of anastomoses around the parts where this membrane is perforated; *c c*, the perforations in the membrane *b*, situated at the commencement of the intercellular passages; *d d*, intercellular passages cut open, extending from the perforations in the bronchial membrane into the dense solid plexus of capillaries surrounding the bronchial tubes; *e e*, the cellular spaces situated between the adjacent lobules containing the trunks of the larger blood-vessels, and corresponding to the interlobular fissures in the lung of the mammal; *f f*, the dark points corresponding to these letters show the very minute areolæ of the almost solid plexus, filling up the space between the bronchial tube *a* and the interlobular fissure *e*. These areolæ communicate with the intercellular passages *d*, and constitute, with these passages, the only part of the plexus unoccupied by the blood-

vessels, and left open for the admission of atmospheric air. These areolæ are filled with air in the recently injected lung, and therefore correspond in their function to the air-cells of mammals.

Fig. 3. Represents the external surface of the lung of the bird; *a a*, interlobular fissures, containing the trunks of the blood-vessels prior to their division and subdivision into their ultimate branches. This part of the lung has the advantage of exhibiting the ultimate distribution of the pulmonary capillaries, without the necessity of any incision being made through the vessels where they are the subject of examination, and therefore of showing the precise mode of arrangement, and degree of density of the pulmonary capillary plexuses, or "retia mirabilia," as they were formerly called.

Fig. 4. Represents a section of the Lung of the Rat.—*a a*, are the air-cells. These, in this class of mammals, as well as in all others in which the respiratory functions are necessarily very active, are very small, and the capillary plexuses by which they are surrounded extremely dense. There is also observable in these animals the greatest possible irregularity in the form of the air-cells; their size also is much greater in the peripheral than in the central parts of the lung; *b*, an intercellular passage.

N.B. It was my intention to have given the measurement of the air-cells in several classes of animals, as near as I could, and also the measurement of the epithelial cells in the small bronchial tubes in each class; but the time which I have had at my disposal has been so little, that I have not been able to accomplish this object.

# AN EXTRAORDINARY CASE

OF

# LÆSION WITHIN THE UTERUS,

WITH

# PARTIAL REPARATION BEFORE BIRTH.

By JOHN DALSTON JONES, M.R.C.S.E.

Communicated by Dr. PEREIRA.

Received Nov. 3d.—Read Dec. 12th, 1848.

I was engaged to attend Mrs. B., of Dalston, in her first confinement; and on Saturday, the 15th of April, 1848, at 1 p.m., she was delivered, at her full term of utero-gestation, of a male child. About 7 a.m. the liquor amnii had escaped without pain; this was the first symptom of her approaching labour. About 9 a.m. I was summoned to see her; the gradual escaping of the liquor amnii was all that yet indicated labour, and at 11 a.m. pains came on in earnest. Owing perhaps to a very roomy pelvis, and the external parts giving way most readily, besides the patient being young and in good spirits, her sufferings were evidently less than usual, and at 1 p.m. the labour terminated by the expulsion of a living male child, of an average size. The funis being divided in the usual manner, the child was removed to an adjoining room to be washed and dressed: the placenta followed in a few minutes, and the uterus contracted firmly.

During the operation of washing, the nurse, and a lady who was anxiously watching the first-born's first ablution, were considerably frightened at seeing an extensive open wound, reaching (as I found upon examination) from the third dorsal vertebra, across the scapula, along the back part of the humerus, to within an inch of the elbow. The child being on his back during the separation of the funis, and placed by me in that position in the nurse's arms, this large

wound was not before observed. When my attention was drawn to it, my impression was that it had been caused, in some inexplicable manner, by the labour; one moment's examination dispelled this idea, for a large proportion, from *a* to *b* (with the exception of the nipple-like process at *a*), was already cicatrized. (See Plate II.) The oval cicatrix, *c, c, c, c,* is, in my opinion, the result of ulceration of the edges of the original wound, which had granulated and healed before birth. The remaining portion, from *b* to *d,* had a healthy granulating surface, indeed, as healthy as a wound healing in the usual manner. The edges were jagged, and at the spinal termination appeared bifurcated, leaving the nipple-like prominence in the middle. The skin and integuments only were implicated, the muscular portion not being in the least affected, as the movements of the arm appeared perfect.

Now the difficulty remains to be solved. How came this wound? Was it while the fœtus was within the uterus, or in its transit? The cicatrix proves that it could not be the last; we, therefore, are obliged to admit, that it *must* have happened *within* the womb, surrounded as the child is with the liquor amnii, &c. The next question is, how did it take place? I had better here give all the information that I have been able to collect from the mother, who is a highly intelligent and well-informed young lady, very desirous to render all the information in her power, so as to throw some light upon what appears to me a very intricate subject. During the whole term of pregnancy, she enjoyed more than her usual good health, taking and enjoying a great deal of walking exercise. She refers the accident to about six weeks before her delivery. When running down stairs in a hurry, she trod upon a cat lying on the stairs; to save herself, she made a sudden spring to the bottom (five or six steps), alighting upon her feet. A severe shock was felt at the time, and a slight faintness. Rest on the sofa, and a glass of wine, soon rallied her. The next day this was followed by a slight sanguineous discharge from the vagina; and as she always makes as light of her ailments as she possibly can, no further notice was

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taken of it; and the circumstance, doubtless, would have been quite forgotten, but for the *marked* child.

*The mother* is disposed to believe that the child was so marked from her imprudence (as she terms it) of playing a great deal upon the harp during pregnancy; necessarily the mother's right arm had to be more upon the stretch than usual, the child's right arm being the one injured, she fancies that there must be some connexion.

Now we must return to the question. How did this injury happen to the child?

1st. Could a blow produce it?

2d. Was it the funis?

3d. Was it by a violent and sudden contraction of the uterus?

And 4th. Was the fall of the mother, six weeks before, the cause? I had better, perhaps, answer these questions *seriatim.*

1st. Could a blow produce it? I feel no hesitation in saying that a blow, however severe, could not lacerate the skin and integuments of a fœtus in utero, surrounded by and floating in the liquor amnii.

2d. Was it the funis? As we have several cases on record, where the funis has acted as a ligature upon a limb, and at length caused its final separation, I thought it worth while to take this possible cause into consideration: however, a very slight examination of the accompanying figure will, I hope, convince every one that the funis could not be the cause. The direction of the wound, the angle formed at the junction of the trunk with the humerus, will be sufficient evidence of the impossibility of any ligature to produce such a mischief.

3d. Was it by a violent contraction of the uterus? I must answer this again in the negative, because a contraction of the uterus would (before any mischief could happen to the fœtus) break the membranes, cause the expulsion of the liquor amnii, and consequently the expulsion of the fœtus. Neither of these having taken place, I believe that contraction of the uterus was not the cause.

4th, and lastly. Was the fall of the mother, six weeks

before, the *efficient* cause? This appears to me, after the most careful examination, the only way that it could happen. Let us first consider the most usual position of the child in utero. "The head is situated towards the os uteri, the vertex being the most dependent part, the chin is pressed upon the chest, the back is bent into a curve, the nates lie at the fundus uteri, the thighs flexed upon the belly, and the legs turned back upon the thighs, one arm is placed upon the side of the head, *and the other upon the breech.*" We suppose that the right arm in this case was placed upon the breech. Could the sudden jump and great muscular exertion of the mother displace this hand from the breech with violence sufficient to cause this extensive laceration? The jagged edges of the wound seem to me to render this explanation not only possible, but the most probable; the extent of the healing process proving that it must have proceeded for some weeks.

After birth, the healing of the wound proceeded most favorably, and in about five weeks no other sign was left than a large cicatrix, the portion under the nipple-like process being the last to heal. This portion is now quite loose, except at its base, and very possibly, at some future period, may require removal, either by the knife or ligature.

As far as my researches have gone, the above case is unique in the annals of midwifery. Its value in a medico-legal point is great indeed; we have only to fancy a case like the following, and this will become sufficiently evident.

Suppose in an unfriended, unmarried female, a mother, anxious to the last moment not to expose herself to the world's scorn, and perhaps not yet having made any preparation for the birth of her child, the same accident should happen as did happen to Mrs. B., and premature labour be produced (which indeed would be a very probable consequence); we should then have a premature child with a wound quite *fresh;* from the premature birth and the wound combined, death would almost to a certainty be produced. Now, before this case, what medical man would have hesitated to

pronounce the death to be caused by the wound? In vain might the poor distressed mother declare that the child was *born* wounded, all medical testimony would have tended to prove the impossibility of such a wound being produced *within* the uterus. Now mark the awful consequence, not impossibly an ignominious end of the poor girl upon the scaffold.

The few cases of smallpox in utero have demonstrated that reparation can go on within the uterine cavity, I will not therefore dwell upon the reparative process in this case.

I thought it best to state the facts of this curious case briefly, and so allow the profession generally to draw their own deductions.

I may here perhaps add, that my partner, James Andrew Welch, Esq., and my friend, William Mark Powell, Esq., surgeon of Chichester, will bear their united testimony to the correctness of the facts, as they both saw the case a day or two after birth.

# APPENDIX

TO A CASE OF

## "SUCCESSFUL REMOVAL OF AN OVARIAN TUMOUR, COMPLICATED WITH PREGNANCY."

By H. E. BURD,

SENIOR SURGEON TO THE SALOP INFIRMARY.

COMMUNICATED BY JAMES PAGET, Esq.

Received Dec. 8th, 1848.—Read Jan. 9th, 1849.

In Volume XXX of the Transactions of the Royal Medical and Chirurgical Society, the successful removal of an ovarian tumour, complicated with pregnancy, is reported. The author of that paper has not lost sight of his patient; and as some circumstances connected with the case have since occurred which he thinks worthy of note, he trusts this communication may not be considered unacceptable or uninteresting.

The patient, Anne Jones, as mentioned in the report, left the hospital on the 15th of November, 1846, to resume her domestic and family duties; during the following year she became pregnant, and went her full time without any untoward symptom; and on the 4th of April, 1848, gave birth to a fine strong male child. She writes word, that her recovery is perfect, but that she did not get up her strength as quickly as was usual in her former confinements, but is now in the enjoyment of uninterrupted and unimpaired health.

Though this may perhaps not be a solitary instance of conception and child-bearing after the removal of a diseased ovary, the author is not aware that such a circumstance has been made known, and he therefore begs to add this short note to the previous communication made to the Society.

# CASE OF EXFOLIATION

OF THE

# ANTERIOR ARCH OF THE ATLAS.

By ROBERT WADE,

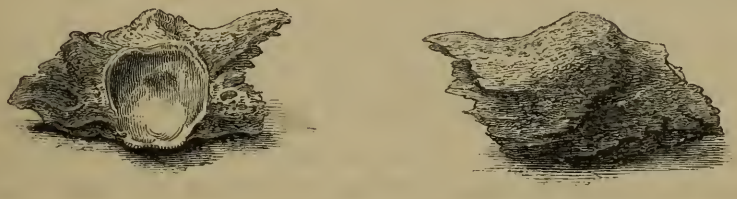
SURGEON TO THE WESTMINSTER GENERAL DISPENSARY.

Received Jan. 8th.—Read Feb. 13th, 1849.

Job Jones, aged 35, a fireman and waterman, residing at 4, Otty's Buildings, Bedfordbury, first applied to me at the Westminster Dispensary, on the 21st of October, 1845. He had a sloughy ulcer, occupying the greater part of the pharynx, and extending from the uvula backwards as far as could be seen. Near the centre of the ulcer was a nipple-like projection of pale granulations, from which pus freely oozed on pressure; and on introducing a probe at this spot, bare and rough bone was felt. The greater part of the soft palate had been destroyed by previous ulceration; and several years before his application to me, a considerable portion of the alveolar and palatine processes of the superior maxillary bone had exfoliated, as had, also, one of the spongy bones. About twelve years ago he had a sore, of the size of a shilling, on the outside of his prepuce, for which he went into an hospital, and took three pills daily for five weeks, when he left the institution with a very sore mouth, the ulcer having then quite healed. A fortnight afterwards he returned to the hospital with an ulcerated throat, which he attributed to his having taken cold from remaining all day in wet clothes. He was ordered a course of mercurial fumigations, which were continued every night for six weeks, during the greater part of that time his mouth being very sore, and the salivation profuse. As the ulceration of his

mouth became much worse during the use of the fumigations, he again left the hospital, and applied to a surgeon, who desired him to discontinue the use of mercury, and to take decoction of sarsaparilla with iodide of potassium. After three or four months of this treatment, he was considered to be quite cured. He remained well for two years, when his throat again became sore, and he resumed the iodide of potassium and sarsaparilla, with the same apparent success as before. In a short time, however, after the discontinuance of his medicines, the ulceration of his throat returned, and has continued more or less to the present time, although he has taken frequent courses of sarsaparilla and iodide of potassium. The exfoliations previously noticed occurred between the third and fourth year from the commencement of his disease. It will be unnecessary to occupy the time of the Society with details of the treatment of the case after the man came under my care; it consisted principally in the administration of sarsaparilla and iodide of potassium, with chloride of soda gargles, as also the occasional application of a strong solution of nitrate of silver to the ulcer; at the same time strict injunctions were given to keep the head as free from movement as possible. The man complained of more or less constant pain in the back part of his neck, and he had occasionally attacks of very acute pain in the same part, with a rigid state of its muscles, which appeared to fix his head in a position which could not be altered without great suffering. Pressure over the upper cervical vertebræ could scarcely be borne. In these attacks, the application of leeches, followed by warm fomentations, afforded most relief; and the easiest position was obtained by the patient reclining on his right side, with the head carefully supported by a pillow. About two months after his application at the dispensary, I was hastily summoned to the man, in one of his spasmodic attacks, and found him in a state of great alarm, caused, he informed me, by his having, when raising himself in bed, felt something give way in the back of his neck, "with a loud crack like the report of a pistol," a like report having been heard also by his wife, who was with him at the time. He became very faint, thinking his neck

was broken, and that he was dying. On looking into his mouth, some coagulated blood was seen adhering to the ulcer. Between this time and May 28, 1846, the spasmodic attacks had been less frequent as well as less severe, on which day, when looking into the pharynx, I observed a small portion of projecting bone, and with very little difficulty removed the greater part of the anterior arch of the atlas, with the entire articulating surface, from the odontoid process of the axis.



The patient was of course desired to use great caution in moving his head, and to prevent its being bent forward, was advised to wear a soldier's stiff stock for some length of time. The ulcer in the throat had for a long time a sloughy appearance; but there was no recurrence of the spasmodic affection of the muscles of the neck, after the removal of the bone, the man having been able, in the course of three months, to resume his usual occupation. The power of turning the head round is at this time nearly perfect, but it can only be bent forward to a very slight extent. The man says that whenever he attempts to bend his head forward, something appears to catch at the back of his neck, which causes pain. He informs me that the throat has occasionally healed, but has become sore again whenever he has taken cold. It has so happened, however, that although I have looked at his throat at various times since the separation of the bone, there has always been a strumous-looking ulceration, covered with a tenacious yellow secretion. There is a considerable depression in the situation of the exfoliated bone.

I have ventured to bring this case before the Medico-Chirurgical Society, with the hope that it may be deemed of sufficient interest to be recorded in its Transactions. I

am not, indeed, aware of there being any similar case on record. Although, from the perfect exfoliation that had occurred, there was good reason to suppose the remaining portion of the atlas to be sound, yet of the result of the case I long entertained considerable fears, as it appeared to me very doubtful whether the transverse ligament of the atlas would have sufficient strength to keep the odontoid process of the axis in its place, when deprived of its bony articulating surface, during the various movements of the head.*

* In Bérard's 'Thèse de la Luxation spontanée de l'Occipital sur l'Atlas, et de l'Atlas sur l'Axis,' a case is recorded, in which the anterior arch of the atlas suddenly gave way with a cracking sound, whilst the man to whom the accident occurred (and who died a month afterwards), was endeavouring to support a large stone upon his head. In that instance, a fungoid tumour was found in the situation of the first two cervical vertebræ, having caused absorption of the greater part of those bones, the anterior arch of the atlas having been fractured in its centre.

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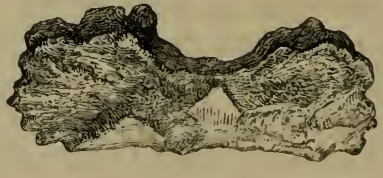
Note.—A case analogous to the foregoing is narrated by Mr. Keate, in the sixteenth vol. of the 'Medical Gazette' (for 1835), and the preparation illustrating this case is in the Museum of St. George's Hospital. By the kindness of Mr. Prescott Hewett, a drawing of the exfoliated portion of bone has been procured, from which the accompanying woodcut was executed.



It exhibits the exfoliated fragment of the anterior arch of the atlas; including, as in Mr. Wade's patient, a portion of the articulating surface for the odontoid process of the axis. In the details of the case (locus citatus), no mention is made of this interesting part of the specimen. In addition to the above exfoliation, a large portion of the basilar surface of the occipital bone, including the lunated edge of the foramen magnum, was cast off.—Ed.

PATHOLOGICAL RESEARCHES

INTO THE

# DISEASES OF THE EAR.

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Received Jan. 9th.—Read Feb. 13th, 1849.

Since the publication in the Medico-Chirurgical Transactions of my two former papers, on the Pathology of the Ear,* further research has enabled me to arrive at certain results, which it is hoped will not be deemed uninteresting to the profession.

The dissections on which the observations contained in this communication are based, amount to 915; and may be thus classified:

| | |
|---|---|
| 1. Ears of persons known to be deaf. . . . | 184 |
| 2. Ears of persons supposed to be deaf . . . | 70 |
| 3. Ears in the stage of incipient deafness . . . | 358 |
| 4. Ears in a healthy state . . . . . | 303 |
| Total . . . . . | 915 |

The *first class* of cases, though including some instances hereafter specified, where the degree of deafness was but slight, comprises none in which a decided diminution of the power of hearing had not been perceptible during life.

The *second class* of cases embraces those where, though the information was defective as to the state of hearing in the life-time of the parties, such extensive traces of disease were

* Volumes XXIV, 1841, and XXVI, 1843. The results of the one hundred and twenty dissections described in these two papers have been included in the subjoined tables.

found in essential parts of the auditory organ, as to leave little doubt that deafness had existed. In the absence, however, of positive information, they are classed as cases of supposed or probable deafness.

The *third class* of cases exhibits those wherein there was a decided pathological condition of the organ, though probably not to the extent which would induce a very perceptible degree of deafness. These I have termed cases of incipient deafness.

It will doubtless excite some astonishment that, in so large a number as 915 dissections, so small a proportion as about one third of the ears should have been found in a perfectly natural state. At first view this might seem to arise from the specimens having, many of them, been supplied from hospitals, infirmaries, and other public institutions, and consequently liable to have been affected, as the result of the various diseases under which the parties might have laboured, and also from the circumstance of my having been kindly furnished by some of my professional friends with special cases, whose diseased state had, during life, attracted their attention. To those, however, who have given the subject much consideration, and who are aware of the widespread prevalence of deafness, in its varying degrees, among all classes of society, the dissections will not, perhaps, be thought to exhibit any unusual proportion of diseased to healthy specimens.

In the accompanying Tables it has been my endeavour to give the leading features of the several dissections in as concise a form as possible. In the first and second class of cases, however, it seemed indispensable to set forth, in succinct detail, the relative pathological conditions presented by different parts of the organ, as also the sex and age of the patient, and the cause of death. The third class of cases, those of incipient deafness, admitted of briefer treatment, and only the general result of their pathological state is exhibited; but it will give me great pleasure to afford, to any member of the profession, fuller information from the original notes of the dissections.

The last of the tables is an abstract statement, intended to show at a glance the pathological condition of the 612 ears included in the preceding classes.

Although I am fully sensible that it would as yet be premature to attempt to deduce any very extensive general conclusions as to the causes of deafness, and the nature of diseases of the ear, from the dissections now brought under the notice of the profession—and each day's experience leads me to infer that little is but yet known, compared with what future investigation may bring to light—yet there are certain observations, even at the present stage of inquiry into the subject, which are not devoid of professional interest, and which I may venture to make with the more confidence, from the fact that several dissections conducted by me, since the tables were framed, are singularly confirmative of the conclusions arrived at.

## MEMBRANA TYMPANI.

In the cases of deafness, the membrana tympani will be observed to have been, in nearly one sixth of the dissections, whiter and thicker than is natural. As this appearance depends generally upon a thickened condition of the mucous membrane lining the inner surface of the tympanic membrane, while the external surface remains smooth and shiny, this feature becomes of great importance to the medical practitioner, as it affords him, during life, an indication of the state of the cavity of the tympanum.

Another frequent and highly interesting pathological condition of the membrana tympani is that in which it adheres by its inner surface to the promontory and the ossicula, or establishes a connexion with them through the agency of bands of adhesion. In the former state, the membrana tympani is necessarily very concave externally, and this concavity is readily distinguishable during life; in the latter, the membrane is only occasionally concave. The adhesion in both instances is so firm, as often to equal in strength the fibrous texture of the tympanic membrane itself. The latter

membrane is also much more tense than natural, and its power of vibration considerably diminished; in many instances, indeed, the tension is so great as to render it impassive to the loudest sounds.

In the formation of the above conditions, the adhesions are produced in the same way as those which will soon be alluded to as connecting the ossicula; but the adherence of the membrana tympani to the promontory grows out of the inflammation of the former membrane, during and subsequent to which, it and the tensor tympani muscle become very relaxed, the tympanic membrane falls inwards, and comes into contact with the mucous membrane covering the surface of the promontory. The latter also, in some cases, is so thickened as to touch and adhere to the healthy membrana tympani. During life I have seen it thick enough to protrude into the meatus, through an orifice in the tympanic membrane.

The proportion of specimens in those classed as deaf, where the membrana tympani appears to have been partially or completely destroyed, is larger, in my opinion, than among the cases occurring in practice, and may be accounted for from the greater attention which the existence of so very palpable a lesion would naturally excite. Although in these cases the sense of hearing was blunted, in many instances it was not so affected as to cause inconvenience in the ordinary intercourse of life. I may state, indeed, from a careful study of cases, some of which are now under my care, that the entire absence of the membrana tympani, provided no other disease of the organ of hearing coexists, is frequently but a trifling impediment to the perception of sounds.

### TYMPANIC CAVITY.

A glance at the tables will show that the part of the organ of hearing which is the most frequent seat of disease is the cavity of the tympanum, and that, as described in my former papers, the peculiar pathological condition which characterises by far the greater number of cases, is a

thickened state of the mucous membrane lining that cavity. This membrane is found to vary from that natural state of fine expansion, which renders its presence on the surface of the bones scarcely perceptible, to a degree of thickness which nearly fills the cavity, and completely buries the ossicula. It was thicker than natural in not less than 98 out of the 184 dissections of deaf persons. And it is instructive to compare these numbers with the proportion of only 19 out of 184 in which there was a collection of mucus, since the latter affection has hitherto been generally regarded as one of the most fertile sources of deafness.

The most common contents of the tympanic cavity are mucus, purulent discharges, and scrofulous matter, which correspond with the three diseases, colds, scarlet fever, and scrofula, from which deafness so frequently results.

A pathological condition of great frequency in the tympanic cavity is the formation of bands of adhesion connecting the ossicula with each other, and with the walls of the tympanum. In 42 of the 184 dissections of deaf ears these adhesions were traced, and they were present in 123 of the 358 dissections classed as those of incipient deafness, or in the large proportions of $\frac{1}{4}$ and $\frac{1}{3}$ respectively. By far the most usual position of these bands of adhesion is between the stapes and the promontory, the former bone being frequently entirely concealed by them. Often their tension and firmness are so great as to prevent any movement of the stapes, while in many instances they press it towards the cavity of the vestibule, as formerly remarked. It would appear highly probable that the pressure exerted on the membranous labyrinth by these adhesions may be one cause of the singing and other sounds so commonly complained of by deaf persons.

The bands of adhesion sometimes arise from the effusion of lymph, which is occasionally observed; but more frequently, perhaps, from the circumstance that, when the membrane is much thickened, the portions of it which are in contact become adherent, so that when the body of the membrane subsides to its natural state, the points of con-

tact remain in cohesion, and the neighbouring parts are drawn into bands. The structure of the bands is firm, and very similar to that of the mucous membrane itself.

One of the most interesting conditions in the pathology of deafness is presented by the anchylosis of the base of the stapes to the margin of the fenestra ovalis, of which the specimens afford 16 complete and 10 partial instances. Sometimes this change consists of simple ossification of the membrane connecting the stapes with the margin of the fenestra ovalis; occasionally the base is considerably enlarged, and projects into the cavity of the vestibule; while in other instances it is surrounded by a deposit of osseous particles. My attention has also been very recently drawn to another condition of the stapes, which consists in its attachment to the circumference of the fenestra ovalis more firmly than is natural, a circumstance which is owing to the solidification of the membrane surrounding its base. Its occurrence is by no means infrequent.

The result of the examination of the Eustachian tube is deserving of particular attention. Of the whole 612 dissections of diseased ears, only 21 cases disclosed any traces of disease of this portion of the ear, a result, however, which agrees with my experience in cases of deafness.* Rarely indeed has it happened, when examining the ear with the otoscope,† during a forcible expiration with closed nostrils, that the air could not be distinctly heard to enter the tympanic cavities, though the nature of the sounds were modified by the internal condition of the cavity. While, to say the least, little or no good generally results from the use of

* It is right I should here state, that the trumpet-shaped extremity of the Eustachian tube was frequently not included in the parts removed for dissection. I am, therefore, unable to speak decidedly respecting its condition. It is, however, probable that, when the narrow portion of the tube was healthy and free from obstruction, the largely-dilated orifice which is acted upon so continually by the muscles of the palate, was also healthy.

† An elastic tube, about eighteen inches in length, tipped with ivory at both ends, one extremity of which is inserted into the external meatus of the patient, and the other into that of the medical man.

the Eustachian catheter, the failure of the operation for puncturing the membrana tympani affords a striking proof, from daily practice, that deafness seldom depends upon obstruction of the Eustachian tubes.

It is singular that another theory of the cause of deafness, which made it to depend upon disease of the internal ear, receives no countenance from these dissections. Even in the few cases, 21 in number, where the labyrinth exhibited disease, that disease was, in nearly every instance, found to be propagated from the middle ear. It may indeed be added, that disease originating in the cavities which contain the expansion of the auditory nerve, or in their contents, is a phenomenon of very rare occurrence.*

The fact of a thickened or otherwise deranged state of the mucous membrane lining the tympanic cavity being one of the most common pathological conditions of the organ of hearing, is the broadest general result of the dissections; and as cases carefully examined, noted and studied as they have arisen in practice, lead to the same conclusion, I have little hesitation in stating disease of that membrane to be the most usual cause of deafness. What are the history and symptoms of the great majority of cases of deafness unattended by discharge? Cold has been caught, uneasiness has been felt, renewed attacks of cold† have added to the severity of the symptoms; advice is at length sought, and examination shows the external meatus deprived of cerumen, and frequently deficient in natural sensibility, while, towards the membrana tympani, its appearance is red and smooth; the membrana tympani is entire, its surface shines, but it is

* In some dissections, especially those from deaf persons where adequate causes of deafness were found in the tympanic cavity, for the sake of preserving the diseased parts, the internal ear was not examined.

† Disease once commenced is modified by many slight and, commonly, little regarded circumstances,—as going from a warm room into the cold air, indulgence even in a glass or two of wine, after a meal, &c.; perspiration from active exercise gives temporary relief; distension of the tympanum with air either relieves or aggravates it; and the sounds so often complained of become louder under the influence of some of these circumstances.

hazy, opaque, or as white as parchment, and consequently the handle of the malleus may be discerned with varying degrees of distinctness, or cease to be visible at all. Upon a forcible expiration, with closed nostrils, the air, by means of the otoscope, can almost always be heard to enter the tympanum, not gradually, however, as when the organ is healthy, but with a puffing, bubbling, or cracking sound, as though impeded in its progress.

It is not my intention, in the present communication, to enter into the detail of the curative measures which the various affections resulting in deafness might seem to indicate, but there are two considerations to which I would direct the attention of the profession. The first is, the large number of cases of incipient disease, and their slow and imperceptible progress, which would reasonably lead us to hope that, by judicious treatment at an early period, the disease might be arrested in its progress, and a permanent cure effected. The other, that my own experience has shown me, that a careful perseverance in the course of remedial measures, which the pathological condition seemed to prescribe, has been attended with an almost unhoped-for success, and would amply justify the expectation, that if a rational mode of treatment, based on careful examination and under intelligent medical guidance, be pursued, the beneficial results in the relief of a disease, in which the moral suffering far exceeds the physical, will be abundantly manifest, and the profession itself be ultimately rescued from the opprobrium which justly attaches to imperfect diagnosis, and consequent empirical measures.

In conclusion, I cannot refrain from subjoining a few remarks on the intimate and important relation which the pathological condition of the ear bears to derangements in other organs. In one third of the dissections, for instance, the upper wall of the tympanum was so attenuated, that the mucous membrane was only separated from the dura mater by a perfectly translucent layer of bone. The upper wall of the tympanum, in 54 other dissections, was imperfect, and

its mucous membrane was actually in contact with the dura mater. In 22 dissections, the lower wall of the tympanum was defective, and the mucous membrane was impinging on the internal jugular vein. The osseous lamina, separating the carotid canal from the tympanic cavity, is not unfrequently so thin as to be diaphanous; and the canal of the portio dura nerve, in its passage through the tympanic cavity, is often imperfect enough to allow of the mucous membrane coming in contact with that nerve. The mastoid cells, again, are frequently found separated from the lateral sinus by a layer of bone of translucent thinness. Sometimes the osseous floor of the external meatus is deficient, being completed by the jugular vein; while its anterior wall is in many cases thin, and in parts so defective, as to bring the membranous meatus in close contiguity with the articulation of the lower jaw.

Numerous cases of disease, propagated from the ear to the brain and the other important organs alluded to, have fallen under my notice, and no very long time will, I trust, elapse before they are prepared, with the dissections, for submission to the profession. For the present I shall confine myself to stating that among these dissections there are instances in which disease has spread,—from the tympanum, upwards, causing inflammation and suppuration of the dura mater, with abscess in the middle lobe of the cerebrum; from the tympanum, below, producing disease of the jugular vein; from the mastoid cells, posteriorly, giving rise to suppuration of the lateral sinus, and diseases of the cerebellum; from the tympanum anteriorly, causing contraction, and almost entire obliteration of the carotid canal, and disease of the internal carotid artery. There are other instances where paralysis of the portio dura nerve has ensued from the pressure upon it of the thick mucous membrane of the cavity of the tympanum; and lastly, where inflammation of the articulation of the lower jaw proceeded to the extent of causing the mouth to remain for some time closed, in consequence of disease being continued to it from the anterior wall of the meatus.

It will readily be conceived that I must be greatly indebted to many medical friends for valuable assistance in procuring specimens. To Mr. Crosse of Norwich, Mr. Ceeley of Aylesbury, Mr. Napper of Guildford, Mr. Greig of Bristol, for contributions from the country;—and to my colleague, Dr. Blakely Brown; Mr. Hewitt, assistant-surgeon of St. George's Hospital; Mr. Henry James Johnson, formerly assistant-surgeon to the same institution; Mr. Avery, surgeon to the Charing Cross Hospital; Dr. Boyd, formerly resident physician to the St. Marylebone Infirmary, and to Dr. Allen, his successor; to Dr. Goodfellow, formerly resident physician to the London Fever Hospital, and to Dr. Sankey his successor; to Mr. Marston, resident medical officer of the Smallpox Hospital, Dr. Merriman jun., Dr. Edward Ormerod, Mr. Farish and Mr. Obre, of London, my sincere thanks are due; and I beg to assure those gentlemen and other members of the profession, that for any opportunities they may afford me of further investigation I shall feel most grateful.

TABLE I.—Cases of Deafness (184).

| No. of the Dissections. | Sex, Age, &c. | Cause of Death. | RIGHT EAR. | | | | | LEFT EAR. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. |
| 40, 41 | Man, æt. 55 | Pneumonia | Dry. Cerumen absent | Opalescent | Mucous membrane thick; anchylosis of stapes to the fenestra ovalis | .... | .... | Dry; cerumen absent | Opalescent | Muc. memb. thick; anchylosisof stapes to the fenestra ovalis | | |
| 47, 48 | Woman, æt. 36 | Dropsy | Contains pus. Cerumen absent | Destroyed by ulceration | Muc. memb. thick | .... | .... | .... | Thick and white | Muc. memb. thick; blood effused on its surface; adhesions between the ossicula; stapes concealed | | |
| 72, 73 | Man, 50 | .... | Contains thick pus | .... | Muc. memb. thick; covered with pus; stapes concealed; malleus absent | Mucous memb. thick | .... | .... | Presents an ulcerated orifice | . . . | Mucous memb. thick | |
| 107, 108 | Old man | Gangrena senilis | .... | .... | Muc. memb. soft, and covered with pus | .... | .... | .... | .... | Adhesions between stapes and promontory | | |
| 134, 135 | Man, 40 very deaf) | .... | Contains a mass of hard cerumen | Presents a large orifice | Muc. memb. thick and ulcerated; incus disjointed from stapes; adhesions between malleus and internal wall of tympanum enveloping the stapes | .... | .... | .... | .... | Adhesions between the ossicula | | |
| 150, 151 | Boy, 16 | Malignant disease of cervical glands | Lower wall imperfectly developd | .... | Muc. memb. thick and vascular; contains much mucus | .... | .... | Full of thick epithelium | Thick; adherent to promontory by a band | Muc. memb. thick and vascular; contains caseous matter | | |

| No. of the Dissections. | Sex, Age, &c. | Cause of Death. | RIGHT EAR. | | | | | LEFT EAR. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. | Meatus. Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. |
| 156, 157 | Child (only slightly deaf) | Enteritis | .... | White | Muc. memb. ulcerated; contains pus; malleus disjointed from incus; tendon of tensor tympani muscle destroyed | .... | .... | .... | .... | Muc. memb. thick and vascular; contains pus | | |
| 171, 172 | Man, 50 | .... | .... | Very concave; adherent to promontory | Muc. memb. thicker than natural | .... | .... | .... | .... | Adhesions between stapes and promontory | | |
| 207, 208 | Woman, æt. 80 | .... | Osseous walls thickened | .... | Muc. memb. in contact with dura mater; upper wall of tympanum absorbed; carotid canal contracted | .... | .... | Almost obliterated; contains pus; bone carious, dark, and rough | Nearly entirely destroyed by ulceration | Muc. memb. thick and red; the bone carious; carotid canal contracted; adhesions between stapes and fenestra ovalis by anchylosis; stapedius muscle atrophied | | |
| 217, 218 | Man, 18 | Consumption | .... | Thick and white; an orifice at its centre | Muc. memb. thick; contains scrofulous matter | .... | .... | .... | .... | Muc. memb. thick; contains viscid mucus | | |
| 227, 228 | Woman, æt. 16 (slightly deaf from the commencement of attack) | Fever; ill seven weeks | Lining memb. thick & soft; full of pus | Destroyed by ulceration | Muc. memb. thick and ulcerated; adhesions between malleus and promontory | Quite healthy | .... | Contains a thick white secretion; lining memb. soft and detached | Nearly destroyed by ulceration | Muc. memb. soft and thick; nearly detached from the bone; covered with pus | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 229, 230 | Man, 50 (many years deaf, particularly in left ear) | .... | Contains a mass of cerumen | Thick and white | Muc. memb. thick; adhesions between the ossicula and internal wall of tympanum | .... | .... | Contains cerumen; lining memb. atrophied | Has an orifice; is thick & white; concave externally; adherent to promonty. | Muc. memb. thick; incus and malleus removed by absorption; cerumen projects through an orifice in the memb. tymp. into cavity of tympanum | | |
| 255, 256 | Woman, æt. 68 (rather deaf) | .... | Contains pus, in which is the incus | Destroyed by ulceration | Muc. memb. nearly destroyed by ulceration; osseous walls carious; internal carotid artery exposed; stapes nearly disconnected from incus and fenestra ovalis | .... | .... | .... | More concave than natural | Adhesions between malleus and promontory | | |
| 273, 274 | Man, 59 | Pneumonia | .... | Almost effaced | Muc. memb. thick; covered with pus; carotid artery contracted | .... | .... | .... | Almost effaced | Muc. memb. thick; covered with pus | | |
| 281, 282 | Man, 17 | Fever; ill 9 days | .... | Destroyed by ulceration | Muc. memb. thick and ulcerated; ossicula absent | .... | .... | Contains pus | Nearly all gone | Muc. memb. ulcerated; incus partially absorbed | .... | Dura mater was nearly detached from bone |
| 283, 284 | Man, 47 | Typhus fever; ill 7 days | .... | Red, and vessels distended with blood | Muc. memb. red and vascular | .... | .... | .... | Vascular | Muc. memb. vascular | | |
| 319, 320 | Man, 30 (partially deaf all his life) | Injury to spine | .... | .... | Adhesions between stapes and fenestra ovalis by anchylosis | .... | Memb. lining vestibule thickened | .... | .... | Muc. memb. thick; adhesions between stapes and fenestra ovalis by partial anchylosis | | |

| No. of the Dissections. | Sex, Age, &c. | Cause of Death. | RIGHT EAR. | | | | | LEFT EAR. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. |
| 341, 342 | Man, 41 (deaf in right ear only) | .... | .... | Thick; white; firmly adherent to promontory | Muc. memb. thick; contains a caseous secretion; adhesions between malleus and promontory so as to conceal the stapes | .... | .... | .... | Partially destroyed; adherent to the stapes and promontory | Muc. memb. thick; base of stapes absorbed; its place occupied by a membrane | | |
| 343, 344 | Woman, æt. 64 | Pneumonia | .... | Concave; white; adherent to promontory | Muc. memb. thick; contains scrofulous matter; the incus, crura of stapes, and part of malleus have disappeared | .... | Membranous labyrinth atrophied | .... | Thick and opaque; upper half destroyed; adherent to promontory | Muc. memb. thick; malleus and incus have disappeared; stapes adheres to memb. tympani | .... | Membranous labyrinth atrophied |
| 349, 350 | Woman, æt. 76 | .... | .... | Calcareous; presents an orifice, & adheres to promontory | Adhesions between stapes and promontory | .... | .... | .... | Connected by adhesions with inner wall of tympanum | Adhesions between stapes and promontory, so as to conceal the stapes | | |
| 373, 374 | Woman, æt. 38 | Dropsy | .... | Concave and dull; white at its centre, which is connected with the promontory | Muc. memb. so thick as to occupy great part of the cavity | Healthy | .... | .... | Concave; hazy | Muc. memb. thick, soft, and vascular | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 385, 386 | Man, 52 | Dropsy | .... | Opaque | Muc. memb. thick; adhesions between stapes and promontory by anchylosis | .... | .... | .... | .... | Muc. memb. thick and soft; adhesions between stapes and fenestra ovalis by anchylosis | .... | Membranous labyrinth thickened |
| 391, 392 | Man, 53 (became deaf after scrofula when young) | Pneumonia | Contains pus and epithelium | Destroyed by ulceration, except a band at anterior margin; the band bound by adhesion to promontory | Thick and covered with scrofulous discharge; ossicula carious and exostosed; tensor tympani muscle atrophied | .... | .... | Contains pus and epithelium | Destroyed by ulceration, except a band at anterior margin; the band bound by adhesion to promontory | Muc. memb. covered with scrofulous discharge; ossicula carious and exostosed; tensor tympani muscle atrophied | | |
| 395 | Man, 50 (deaf in right ear only) | Diseased liver | .... | Nearly effaced | Muc. memb. thick; contains scrofulous matter; malleus removed | | | | | | | |
| 403, 404 | Man, 26 (especially deaf in right ear) | Syphilitic disease of the cranial bones | .... | Opaque; internal layer thicker than natural | Muc. memb. thick and vascular; adhesions between the mastoid cells and stapes by a band of adhesion half an inch long | .... | .... | Contains thick pus | Soft and vascular; connected with promontory by adhesions | Muc. memb. thick; portions of smooth bone lying on its surface | | |
| 413, 414 | Man, 37 | Accidental | Contains a collection of cerumen | .... | . . . . | .... | .... | Cerumen | White | Muc. memb. thick, contains thick mucus | | |
| 419 | Woman, 29 (deaf in right ear only) | Diseased liver | .... | White & soft; presented an ulcerated orifice | Muc. memb. thick, soft, and ulcerated | | | | | | | |

| No. of the Dissections. | Sex, Age, &c. | Cause of Death. | RIGHT EAR. | | | | | LEFT EAR. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. |
| 423, 424 | Man, 46 | Mortification of lungs | .... | .... | Muc. memb. thick | .... | .... | .... | Upper part gone, lower part fallen inwards, & firmly adherent to stapes | Muc. memb. thick; malleus and incus pushed into the mastoid cells; adhesions between stapes and promontory | | |
| 429, 430 | Woman, æt. 36 (especially deaf in right ear) | Consumption | .... | Partly destroyed; the remainder calcareous | Muc. memb. thick; adhesions between stapes and fenestra ovalis by anchylosis | .... | Membrane atrophied; fluid deficient | .... | .... | Muc. memb. thick; adhesions between stapes and promontory | | |
| 435, 436 | Girl, 11 | Consumption | .... | Concave & opaque; an orifice at its posterior part, the margins of which are attached to stapes | Muc. memb. thick; the long process of incus has disappeared | .... | .... | .... | Opaque and concave | Muc. memb. thick, soft, and vascular; contains pus and mucus | | |
| 441, 442 | Woman, æt. 70 | Pneumonia | Contains dark pus | Soft and concave; adherent to promontory and stapes | Muc. memb. very thick | .... | .... | .... | Contains calcareous deposit | | | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 445, 446 | Man, 80 | Asthma | .... | Connected with inner wall of tympanum by numerous adhesions | .... | More vascular than natural | .... | .... | Connected with promontory by adhesions | | | | |
| 457, 458 | Man, 25, (especially deaf in left ear) | Fever | .... | .... | Mucous membrane vascular | .... | .... | .... | Adherent to malleus by a firm band | Muc. memb. thick; contains oily matter | | | |
| 465, 466 | Woman, æt. 94 | Apoplexy | .... | A small portion only remains, which is attached to promontory | Muc. memb. very thick; malleus gone; stapes concealed | .... | .... | .... | Thick and opaque; upper part firmly adherent to promontory and stapes | Adhesions between the ossicula; stapes drawn into vestibule | .... | Membranous labyrinth much atrophied; fluid deficient | |
| 477, 478 | Woman, æt. 34 | Fever; ill six weeks | .... | .... | Muc. memb. thick; adhesions between stapes and fenestra ovalis by partial anchylosis | .... | Labyrinthine humors deficient | .... | .... | Adhesion between stapes and fenestra ovalis by complete anchylosis | .... | Humours of labyrinth deficient | |
| 483 | Woman, 41 (deaf in right ear only) | Dropsy | .... | Dull | Adhesions between the ossicula; the stapes concealed by them | | | | | | | | |
| 499, 500 | Woman, 60 (especially deaf in left ear) | Gangrene | .... | Very concave and opaque | Muc. memb. thick; adhesions between the ossicula; stapes buried and concealed | .... | .... | .... | White, concave; inner layer thick | Muc. memb. thick and red; contains a large quantity of thick mucus; tensor tympani muscle atrophied | | | |
| 505 | Woman, 40 (deaf in right ear only) | Consumption | Contains epithelium and pus | Entirely destroyed | Muc. memb. thick, red, and vascular; ossicula have disappeared | .... | Labyrinthine fluids disappeared | | | | | | |

| No. of the Dissections. | Sex, Age, &c. | Cause of Death. | RIGHT EAR. | | | | | LEFT EAR. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. |
| 509, 510 | Man, 22 (especially deaf in left ear) | Consumption | .... | Contains patches of calcareous matter; connected with promontory by bands | .... | .... | .... | .... | Nearly entirely destroyed by ulceration | Muc. memb. very thick | | |
| 517, 518 | Man, 56 | Consumption | .... | White and thicker than natural | Muc. memb. so thick as nearly to fill tympanic cavity | .... | Membranous labyrinth thick | .... | .... | Muc. memb. very thick | | |
| 521, 522 | Man, 50 | Consumption | .... | White and vascular | Muc. memb. thick and vascular; tensor tympani muscle atrophied | .... | .... | .... | Opaque | Muc. memb. thick and vascular | | |
| 531, 532 | Man, 40 | .... | .... | White and flat | Muc. memb. thick and white | .... | .... | .... | White and flat | Muc. memb. thick and white | | |
| 535, 536 | Woman, æt. 50 | Committed suicide | .... | .... | Muc. memb. thick and red; adhesions between incus and and inner wall of tympanum; stapes concealed | .... | .... | .... | .... | Muc. memb. thick and red; adhesions between incus and inner wall of tympanum | .... | Labyrinthine fluid hazy |
| 547, 548 | Man, 44 | Consumption | Contains a collection of cerumen | Dull | Muc. memb. thick; contains mucus | .... | .... | Contains a collection of cerumen | White; connected with promontory by bands | Muc. memb. thick and soft; malleus, incus, stapes, and promontory connected by adhesions | | |
| 555, 556 | Man, 41 (slightly deaf) | Apoplexy | .... | Partially calcareous | .... | .... | .... | .... | Partially calcareous | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 565, 566 | Man, 36 (especially deaf in right ear) | Consumption | .... | .... | Adhesions between stapes and fenestra ovalis by firm anchylosis | .... | Labyrinthine fluids much diminished | .... | .... | Adhesions between stapes and fenestra ovalis by partial anchylosis | | |
| 569, 570 | Man, 60 | Asthma | .... | Destroyed by ulceration | Muc. memb. exceedingly thick; stapes entirely concealed; adhesions between stapes and fenestra ovalis more firm than natural | .... | .... | .... | Destroyed by ulceration | Muc. memb. very thick; adhesions between stapes and fenestra ovalis very firm | .... | Membranous labyrinth thickened |
| 571, 572 | Man, 28 (slightly deaf) | Apoplexy | .... | Thicker than natural; red at its circumference | Muc. memb. thick and red | .... | .... | .... | .... | Muc. memb. thicker than natural | | |
| 575 | Man (deaf in right ear only) | .... | .... | Very concave and flabby; adherent to promontory | | | | | | | | |
| 589, 590 | Man, 31 (deaf for many years) | .... | .... | .... | Muc. memb. much congested and thickened; contains mucus; adhesions between stapes, promontory and pyramid | .... | .... | .... | .... | Muc. memb. thick and vascular; adhesions between stapes, promontory, and pyramid | | |
| 599, 600 | Woman, 65 (deaf many years, especially right ear) | Paralysis | .... | Opaque & thicker than natural | Muc. memb. very thick; adhesions between incus and inner wall of tympanum | .... | .... | .... | .... | Adhesions between malleus, tensor tympani muscle, and stapes | | |

| No. of the Dissections. | Sex, Age, &c. | Cause of Death. | RIGHT EAR. | | | | | LEFT EAR. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. |
| 602 | Man, 64 | Inflammation of lungs | .... | .... | .... | .... | .... | .... | Destroyed by ulceration | Muc. memb. dark and thick; contains pus; adhesions between stapes and fenestra ovalis more firm than natural; partial anchylosis | | |
| 605, 606 | Man, 40 (deaf in both ears during a cold) | .... | .... | Opaque | Muc. memb. thick and red; stapes nearly concealed; contains mucus; adhesions between stapes and promontory | Contains mucus | .... | .... | Opaque | Muc. memb. thick and red; stapes nearly concealed; contains mucus; adhesions between stapes and promontory | Contains mucus | |
| 609, 610 | Man, 45 | .... | Contains a collection of cerumen | .... | .... | .... | .... | Contains a collection of cerumen | | | | |
| 617, 618 | Woman, 50 (deaf during many years) | .... | .... | Nearly all destroyed by ulceration; margin attached to promontory | .... | .... | .... | .... | .... | Muc. memb. thick; malleus and incus partially destroyed by caries; stapes gone | | |
| 623, 624 | Child, æt. 6 months | Scrofula | .... | White | Muc. memb. thick and vascular; contains mucus and pus | .... | .... | .... | Soft and red | Muc. memb. thick and vascular; contains mucus and pus | | |
| 625, 626 | Boy, 5 | Scarlatina | .... | .... | Muc. memb. thick and vascular; cavity full of pus | .... | .... | .... | .... | Muc. memb. thick; lymph effused; adhesions forming | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 653, 664 | Woman, æt. 21 (deafness came on after scarlet fever) | Erysipelas | .... | White and thick; an orifice at the upper part | Muc. memb. thick and vascular; mucus and pus | .... | .... | .... | White and thick; orifice at the upper part | Muc. memb. thick and vascular |
| 659, 660 | Woman, æt. 60 (deafness came on very gradually) | Bronchitis | Contains a collection of cerumen | White and concave; small process of malleus projects adherent to promontory | Muc. memb. thick; adhesions between the ossicula and membrana tympani | .... | .... | Contains a collection of cerumen | White and concave; connected with promontory | Muc. memb. thick; adhesions between the ossicula and membrana tympani |
| 673 | Man, 27 (slightly deaf in left ear) | Consumption | .... | .... | . . . . | .... | .... | .... | Connected by large bands with promontory | Adhesions between the ossicula |
| 675, 676 | Woman, 26 (very deaf in right ear; slightly so in left; scarlet fever when a child) | Childbirth | .... | Destroyed by ulceration | Muc. memb. thick, white, soft and ulcerated; bones disconnected | .... | .... | .... | .... | Muc. memb. thick; a false membrane covers the fenestra ovalis; adhesions between stapes and promontory |
| 677, 678 | Man, 60 | Apoplexy | .... | Opaque; inner layer thick | Muc. memb. thick; contains scrofulous matter; adhesions between stapes, incus, and inner wall of tympanum; partial anchylosis | .. | .... | .... | Opaque & thicker than natural | Muc. memb. thick; adhesions between stapes, incus, and inner wall of tympanum; partial anchylosis |

| No. of the Dissections. | Sex, Age, &c. | Cause of Death. | RIGHT EAR. | | | | | LEFT EAR. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. | Meatus. Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. |
| 679, 680 | Woman, æt. 30 | Consumption | .... | White, concave, tense, & thick; adheres to the inner wall of tympanum | Adhesions between all the ossicula | .... | .... | .... | Thick, concave, & tense; adherent to promontory | Adhesions between all the ossicula | | |
| 687, 688 | Man, 40 (scrofulous when young) | Dropsy | .... | White & thick; upper part gone; adherent to promontory | Adhesions between all the ossicula | .... | Fluid in vestibule deficient in quantity | .... | White and thick; adherent to promontory | Adhesions between all the ossicula | .... | Fluid in vestibule deficient in quantity |
| 707, 708 | Child, 2½ | Consumption | .... | Destroyed by ulceration | Muc. memb. covered with scrofulous matter, and so thick as nearly to fill cavity of the tympanum | .... | .... | .... | Thick, white, and soft | Muc. memb. very thick and red, and contains scrofulous matter | | |
| 709, 710 | Woman, æt. 40 | Diseased uterus | .... | White; thicker and more concave than natural | Muc. memb. thick and white; contains mucus | .... | .... | .... | White, thick, & concave | Muc. memb. thick and white; adhesions between malleus, incus, and tympanum | | |
| 713, 714 | Man, 44 (had been growing deaf during many years) | Diseased bladder | Contains a collection of cerumen | White, shining & concave; adherent to incus | Muc. memb. thick; adhesions between stapes and promontory; partial anchylosis | .... | .... | .... | .... | Muc. memb. thick; adhesions between stapes and promontory; partial anchylosis | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| 715, 716 | Woman, æt. 48 | Cancer of the liver | .... | .... | Muc. memb. thick; adhesions between stapes and promontory | .... | .... | .... | .... | Muc. memb. thick; adhesions between stapes and promontory |
| 719, 720 | Youth, 17 | Consumption | .... | Thicker than natural | Muc. memb. thick | .... | .... | .... | Soft and flabby; firmly adherent to promontory | Muc. memb. thick and red |
| 721, 722 | Girl, 8½ | Measles | .... | .... | Muc. memb. very thick, so as nearly to fill the cavity of the tympanum | .... | .... | .... | .... | Muc. memb. very thick; tympanic cavity nearly filled by it |
| 745, 746 | .... | Fever | .... | Adherent to promontory by bands | Muc. memb. very thick | .... | .... | .... | Soft | Muc. memb. thick; full of mucus |
| 753, 754 | Woman, 73 (deaf in right ear from childhood, and latterly in the left) | Fever | .... | Presents a large orifice; the remaining portion thick and white | Muc. memb. very thick; covered with pus; adhesions between stapes and promontory more firm than natural | .... | .... | .... | Opaque and thicker than natural | Muc. memb. thick |
| 755, 756 | Man, 60 | Pneumonia | .... | .... | Muc. memb. very thick; stapes concealed | .... | .... | .... | .... | Muc. memb. very thick |
| 757, 758 | Man, 74 (slightly deaf) | Enteritis | .... | Thick and opaque | . . . . | .... | .... | .... | Thicker than natural | Muc. memb. thick |
| 761, 762 | Woman, æt. 69 | Dropsy | .... | Whiter than natural | Muc. memb. thick; contains mucus | .... | .... | .... | Thick and white | Muc. memb. thick; contains mucus |

| No. of the Dissections. | Sex, Age, &c. | Cause of Death. | RIGHT EAR. | | | | | LEFT EAR. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. |
| 765 | Man, 68 (deaf in right ear only) | Consumption | .... | Opaque | Muc. memb. very thick; stapes concealed | | | | | | | |
| 769, 770 | Woman, æt. 70 | Asthma | Contains a collection of cerumen | .... | . . . . | .... | .... | Contains a collection of cerumen | | | | |
| 779, 780 | Man, 27 | Diseased kidneys | .... | So white and thick that the malleus is not visible thro' it | Muc. memb. thick | .... | .... | .... | Opaque | Muc. memb. thick and soft | | |
| 782 | Man, 45 (deaf in left ear only) | Dropsy | .... | .... | . . . . | .... | .... | .... | Thick; white at the circumference; concave | Muc. memb. thick and soft; adhesions between the ossicula; so numerous as nearly to fill the cavity | | |
| 789 | Man, 70 (deaf in right ear only) | Consumption | .... | Presents a large ulcerated orifice | | | | | | | | |
| 795, 796 | Child, æt. 6 (deaf from birth) | Convulsions | .... | .... | Muc. memb. very thick; stapes concealed; mem. of fenestra rotunda red & pulpy; adhesions between stapes & fenestra ovalis by anchylosis | .... | Labyrinthine memb. red, and contains bloody serum | .... | .... | Muc. memb. thick; stapes concealed; adhesions between stapes and fenestra ovalis by partial anchylosis | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 797, 798 | Woman, 90 (dea. in left ear many years) | .... | .... | .... | Muc. memb. thick; adhesions between stapes and promontory | .... | .... | .... | Very concave | Adhesions between all the ossicula | Fluid of vestibule deficient |
| 807, 808 | Woman, æt. 26 | Pneumonia | .... | .... | Muc. memb. thick and red; contains mucus | .... | .... | .... | .... | Muc. memb. thick and red; contains mucus | |
| 809, 810 | Woman, æt. 57 | Rheumatism | .... | Opaque and thicker than natural | Muc. memb. thick and soft; contains offensive pus | .... | .... | .... | White and thick | Muc. memb. thick and soft | |
| 815 | Girl, 10 | Diseased bone of the ear | .... | Destroyed by ulceration | Muc. memb. ulcerated; bone carious | | | | | | |
| 816, 817 | Woman, æt. 79 | Gangrena senilis | .... | Thick and very concave; adherent to promontory | Muc. memb. thick; incus partly absorbed; adhesions between stapes and promontory by anchylosis | .... | Membranous labyrinth very thick | .... | White; very thick and very concave; adherent to promontory | Muc. memb. very thick in parts; incus disjointed from stapes and partially absorbed; adhesions between stapes and promontory by anchylosis | |
| 832, 833 | Man | .... | .... | White and very concave | Muc. mem. healthy; tensor tympani muscle atrophied | .... | Membranous labyrinth atrophied | .... | White and very concave | Muc. mem. healthy; tensor tympani muscles atrophied | Membranous labyrinth atrophied |
| 844 | Man (deaf in right ear only) | Consumption | .... | .... | Muc. memb. very thick; full of tenacious mucus | | | | | | |
| 847 | Man, 45 (deaf in left ear only) | Consumption | .... | .... | . . . . | .... | .... | .... | Destroyed by ulceration | Muc. memb. contains scrofulous matter | |

| No. of the Dissections. | Sex, Age, &c. | Cause of Death. | RIGHT EAR. | | | | | LEFT EAR. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. |
| 855, 856 | Man, 60 | Dropsy | Full of cerumen and epithelium | White, thicker than natural and concave; adherent to promontory by bands | Muc. memb. very thick; stapes nearly concealed; incus absorbed | .... | .... | .... | .... | Muc. memb. thick and red; stapes partly concealed | | |
| 863, 864 | Man, 73 | Consumption | .... | .... | Muc. memb. very thick and soft | .... | .... | .... | .... | Muc. memb. very thick and soft | | |
| 867, 868 | Man (deaf for four years) | Bronchitis | .... | .... | Muc. memb. thick and soft | .... | .... | .... | .... | Muc memb. thick and soft | | |
| 877, 878 | Woman, æt. 39 | Consumption | .... | Dull; inner layer white | Muc. memb. thick and soft; adhesions between stapes and promontory | .... | There is a membranous band between the base of the stapes and the wall of the vestibule | .... | .... | Muc. memb. thick | | |
| 879, 880 | Woman, æt. 50 | Consumption | .... | .... | Muc. memb. thick; adhesions between stapes and promontory by partial anchylosis | .... | .... | .... | White | Muc. memb. very thick; covered with mucus; adhesions between stapes and promontory by partial anchylosis | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| 881, 882 | Man, 50 | Apoplexy | .... | .... | Muc. memb. thick | .... | .... | .... | .... | Muc. memb. thick |
| 887 | Young man, 17 (deaf in right ear only) | .... | .... | Destroyed by ulceration | Muc. memb. thick; full of dark pus; stapes gone | .... | Full of pus; auditory nerve thick, red, and hard | | | |
| 907 | Man, 45 (deaf in right ear) | .... | .... | Opaque | Muc. memb. thick; the ossicula connected by very firm adhesions | | | | | |
| 910, 911 | Man, 40 | .... | Contains cerumen | Thick and white | Muc. memb. very thick; covered with dark mucus; adhesions between ossicula, and concealing them | .... | .... | Contains a collection of cerumen | White and partly absorbed | Muc. memb. thick and white; contains mucus; numerous strong adhesions between the ossicula |
| 912, 913 | Man, 30 | .... | .... | .... | Muc. memb. thick; covered with pus | .... | .... | .... | Ulcerated; presents a large orifice | Muc. memb. thick and dark coloured; stapes nearly concealed and firmly fixed in the fenestra ovalis |

## TABLE II.—CASES OF DISEASE AND PROBABLE DEAFNESS.

| No. of the Dissections. | Sex, Age, &c. | Cause of Death. | RIGHT EAR. | | | | | LEFT EAR. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. |
| 34 | Adult | Delirium tremens | Contains offensive pus | Ulcerated. An orifice | Mucous membrane covered with thick pus | | | | | | | |
| 68, 69 | Young woman | Tuberculous disease | .... | Hazy | Muc. memb. very thick; stapes nearly concealed; contains mucus; adhesions between malleus and promontory | Mucous memb. congested | .... | .... | .... | Muc. memb. thick; adhesions between stapes and promontory | | |
| 78, 79 | Woman, æt. 45 | Burn over head and face | Vascular | Concave, shrivelled and dry; stapes projects through it | Muc. memb. red and thick; full of serum and lymph | .... | .... | .... | Concave and white; an orifice, the edges of which adhere to the promontory | Muc. memb. thick and vascular | Red and soft | |
| 109, 110 | Man, 50 | Effusion on brain | .... | .... | Muc. memb. thick and soft; contains serum | .... | .... | .... | .... | Very strong and numerous adhesions between the membrana tympani and ossicula | | |
| 115, 116 | Man, 40 | Consumption | Full of cerumen | .... | Muc. memb. thick and vascular; adhesions between incus and memb. tympani, stapes and promontory | .... | .... | Full of cerumen | .... | Adhesions between memb. tympani, incus, stapes, and promontory | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| 117, 118 | Man, 22 | Epilepsy | .... | Presents an orifice | Muc. memb. vascular; contains pus; adhesions between stapes and promontory | .... | .... | Vascular | Vascular; presents an orifice | Muc. memb. very red; adhesions between memb. tympani and stapes |
| 125[a], 126[a] | Man, 24 | Fever | .... | .... | Muc. memb. vascular; vessels large and tortuous; adhesions between stapes and promontory | .... | .... | .... | .... | Muc. memb. thick and vascular; contains mucus; adhesions between memb. tympani, malleus, and promontory |
| 130 | Man, 40 | Bright's disease | .... | .... | . . . . . | .... | .... | .... | Thin, drawn inwards, and adheres to promontory | Muc. memb. thick; the long process of incus absorbed |
| 131, 132 | Child, 10 | Consumption | .... | Destroyed by ulceration | Muc. memb. thick and pulpy; adhesions between stapes and promontory | .... | .... | .... | Destroyed by ulceration | Muc. memb. thick and pulpy; adhesions between stapes and promontory |
| 144, 145 | Woman, æt. 60 | Paralysis | .... | An orifice nearly a line in diameter; adheres to promontory | . . . . . | .... | .... | .... | Very concave | Adhesions between stapes and promontory |
| 154 | Child, 6 | Cholera | .... | .... | Mucous membrane very vascular, and so thick as to bury the stapes in it | | | | | |

| No. of the Dissections. | Sex, Age, &c. | Cause of Death. | RIGHT EAR. | | | | | LEFT EAR. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. |
| 163, 164 | Boy, 15 | Fever | .... | Opaque, vascular; blood-vessels continuous with those of meatus | Muc. memb. vascular, thick, full of pus | .... | .... | Contains cerumen | .... | Muc. memb. dark and vascular; contains thick pus | | |
| 167 | Man, 45 | .... | .... | Concave; attached by strong adhesions to promontory | | | | | | | | |
| 173 | Woman, æt. 35 | Fever; ill eleven days | .... | Opaque and concave | Muc. memb. red; lymph effused; stapes concealed; mastoid cells full | | | | | | | |
| 175, 176 | Man, 19 | Scarlet fever; ill five weeks | .... | Central part destroyed by ulceration | Muc. memb. thick and ulcerated; serum and pus effused; incus and stapes rough and disconnected | .... | .... | .... | Central portion destroyed by ulceration | Muc. memb. thick and ulcerated | | |
| 181 | Child, æt. 9 months | Diseased lungs | .... | .... | Muc. memb. very thick; stapes quite imbedded | | | | | | | |
| 195 | Man, 68 | Concussion of brain after some days | .... | .... | Muc. memb. very thick; stapes nearly concealed | | | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 197 | Man, 63 | Consumption | Contains cerumen | Connected with stapes | Muc. memb. thick and opaque; adhesions between stapes and promontory | | | | | |
| 209, 210 | Man, 28 | Fever; ill two days | .... | Hazy | Muc. memb. thick and very vascular; contains serum and pus | .... | .... | .... | .... | Muc. memb. very thick and vascular |
| 211 | Man, 63 | Fever; ill six weeks | Contains hard cerumen in contact with memb. tymp. | Dull | Muc. memb. thick and vascular; contains serum and pus | | | | | |
| 272 | Woman, æt. 65 | Inflammation of lungs | .... | .... | . . . . | .... | .... | .... | Presents a large orifice at its centre; malleus and incus absent | Muc. memb. in contact with dura mater; tensor tympani muscle atrophied |
| 275, 276 | Man, 64 | Asthma | .... | .... | Adhesions between the base of the stapes and the fenestra ovalis by anchylosis | .... | .... | .... | .... | Adhesions between the base of the stapes and the fenestra ovalis by anchylosis |
| 323 | Man, 23 | Consumption | .... | Opaque | Muc. memb. very thick; stapes concealed; adhesions between stapes and promontory | | | | | |
| 359, 360 | Woman, æt. 17 | Scarlet fever | Tumefied and vascular | Thick, soft, vascular; very concave | Mucous memb. red, soft, and thick | Quite healthy | .... | Vascular | Soft and vascular | Muc. memb. very vascular; pus and lymph effused |

| No. of the Dissections. | Sex, Age, &c. | Cause of Death. | RIGHT EAR. | | | | | LEFT EAR. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. |
| 369, 370 | Man, 80 | Diseased brain | .... | White; inner layer thick | Mucous membrane very thick; stapes buried; mucus in large quantity | .... | .... | .... | White, inner surface thick | Muc. memb. contains a large quantity of mucus | | |
| 463, 464 | Woman, æt. 53 | Dropsy | .... | Thick and opaque; connected with stapes | Adhesions between stapes, membrana tympani, and promontory | .... | ... | .... | Thick and opaque; connected with stapes | Muc. memb. thick; adhesions between stapes and promontory; stapes firmly fixed | | |
| 485, 486 | Woman, æt. 42 | Consumption | .... | .... | Muc. memb. white and ulcerated; stapes nearly disconnected from the fenestra ovalis | .... | .... | .... | .... | Muc. memb. white and ulcerated | | |
| 496 | Woman, æt. 66 | Pneumonia | .... | .... | . . . . | .... | .... | .... | .... | Muc. memb. thick; contains pus and mucus | | |
| 529, 530 | Man, 40 | .... | .... | Thick, white, concave; adherent to stapes | Muc. memb. thick and vascular | .... | .... | .... | Thick and white; adheres to stapes | Muc. memb. thick and vascular | | |
| 629, 630 | Child of 6 months | .... | .... | White; much congested | Muc. memb. so thick as nearly to fill the tympanic cavity | .... | .... | .... | White; much congested | Muc. memb. very thick | | |
| 705, 706 | Child, æt. 1 year | Hydrocephalus | .... | .... | Mucous memb. red and much swollen; contains mucus | .... | .... | .... | Presents a large ulcerated orifice | Muc. memb. red and much swollen; contains mucus | | |
| 711, 712 | Woman, æt. 64 | Consumption | .... | Nearly destroyed by ulceration | Mucous membrane contains scrofulous matter | .... | .... | .... | .... | Muc. memb. contains scrofulous matter | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 723, 724 | Infant, 9 months | Measles | .... | White and soft; vessels large and numerous | Muc. memb. red, soft, and pulpy; contains blood and mucus; adhesions between malleus, incus, and inner wall of tympanum | .... | .... | .... | Ulcerated; a large orifice at the posterior part | Muc. memb. thick and ulcerated; incus disconnected |
| 728 | Girl, 9 | Diseased hip | .... | .... | . . . . | .... | .... | .... | Destroyed by ulceration | Muc. memb. ulcerated and very thick; contains scrofulous matter |
| 729, 730 | Child, æt. 18 mths. | Measles | .... | Red | Muc. memb. thick; contains muco-purulent matter | .... | .... | .... | Red | Muc. memb. thick, red, and soft; contains muco-purulent matter |
| 745, 746 | Boy, 3 | Scarlatina | .... | Thick and red | Muc. memb. very thick, so as nearly to fill the cavity of the tympanum | .... | .... | .... | Thick and red | Muc. memb. very thick, nearly filling the tympanum |
| 771 | Man, 75 | Pneumonia | .... | .... | Muc. memb. contains a large quantity of mucus | | | | | |
| 813 | Woman, æt. 35 | Consumption | .... | .... | Muc. memb. soft and thick; contains viscid mucus | | | | | |
| 859, 860 | Woman, æt. 71 | Consumption | .... | Connected with promontory | Muc. memb. thick | .... | .... | .... | Connected with promontory | Muc. memb. thick |
| 861, 862 | Woman, æt. 34 | Apoplexy | .... | Connected with inner wall of tympanum | Muc. memb. thick; adhesions between stapes and promontory | .... | .... | .... | Connected with inner wall of tympanum | Muc. memb. thick; adhesions between stapes and promontory |

| No. of the Dissections. | Sex, Age, &c. | Cause of Death. | RIGHT EAR. | | | | | LEFT EAR. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. | Meatus Externus. | Membrana Tympani. | Cavitas Tympani. | Eustachian Tube. | Internal Ear. |
| 889 | Man, 19 | Consumption | .... | .... | Muc. memb. so thick as to conceal the stapes | | | | | | | |
| 893 | Woman, æt. 25 | .... | .... | .... | Muc. memb. thick, soft, and ulcerated | | | | | | | |
| 903 | Woman, æt. 53 | Fistula in ano | .... | A large orifice in the centre; connected with stapes | Adhesions between the stapes, malleus, and promontory | | | | | | | |
| 905, 906 | Child, æt. 2 years | Consumption | .... | Ulcerated | Muc. memb. soft; contains mucus | .... | .... | .... | Very vascular | Muc. memb. thick and soft; contains mucus | | |
| 70 | Total. | | | | | | | | | | | |

## TABLE III.—CASES OF INCIPIENT DEAFNESS, 358.

| | | |
|---|---|---|
| Meatus Externus | Having a collection of cerumen | 28 |
| | ,, ,, and epithelium | 5 |
| | ,, ,, and rye seeds | 2 |
| | ,, ,, epithelium only | 1 |
| Membrana Tympani | Thick and vascular | 3 |
| | Very concave externally | 4 |
| | Thick and whiter than natural | 11 |
| | Connected with promontory by adhesions | 16 |
| | ,, stapes by adhesions | 5 |
| | ,, stapes and promontory by adhesions | 1 |
| | ,, stapes and chorda tympani | 1 |
| | ,, incus | 6 |
| | ,, all the ossicles and the promontory | 3 |
| Cavitas Tympani — Contents | Mucus: the membrane being healthy | 13 |
| | Mucus: the membrane being thick | 5 |
| | Serum: the membrane being vascular | 4 |
| | Blood | 2 |
| | Calcareous matter | 5 |
| | Scrofulous matter | 6 |
| | Serum and lymph | 1 |
| | Purulent matter | 1 |
| Cavitas Tympani — State of Mucous Membrane | More vascular than natural | 28 |
| | Thicker than natural | 71 |
| | Ulcerated | 2 |
| | Flocculent | 1 |
| | Black pigment secreted beneath it | 2 |
| | Effusion of blood beneath it | 8 |
| | ,, serum ,, | 1 |
| Cavitas Tympani — Adhesions between | Malleus and stapes | 1 |
| | ,, and promontory | 4 |
| | Malleus and promontory | 5 |
| | Incus and promontory | 1 |
| | Incus, stapes, and promontory | 3 |
| | Incus, tensor tympani muscle, and promontory | 1 |
| | Stapes and promontory: mucous membrane healthy | 66 |
| | ,, ,, ,, vascular | 6 |
| | ,, ,, ,, thick | 30 |
| | Stapes and tensor tympani muscle | 3 |
| | Chorda tympani nerve and incus | 1 |
| | ,, ,, incus, stapes, and promontory | 2 |
| | ,, ,, and upper wall of tympanic cavity | 1 |
| | All the ossicula and the promontory | 5 |
| Cavitas Tympani — Fenestra Rotunda | Bands of adhesion over the fenestra rotunda concealing the membrane | 3 |
| Eustachian Tube | Containing mucus | 8 |
| | Lining membrane thick and vascular | 3 |
| | Bands of adhesion connecting the parietes | 3 |

## TABLE IV.

## TABULAR ABSTRACT OF THE CONDITION OF THE 612 DISEASED EARS.

| | | Cases of Deafness, 184. | Cases of Probable Deafness, 70. | Cases of Incipient Deafness, 358. |
|---|---|---|---|---|
| Meatus Externus | Containing a collection of cerum | 16 or $\frac{1}{11}$ | 4 or $\frac{1}{17}$ | 28 or $\frac{1}{13}$ |
| | „ „ of cerum and epithelium | 1 | — | 5 |
| | Containing a collection of cerum and rye-seeds | — | — | 2 |
| | Containing a collection of epithelium | 1 | — | 1 |
| | Containing a collection of pus | 9 | 1 | — |
| | „ „ of pus and epithelium | 3 | — | — |
| | Membrane thick | 2 | — | — |
| | „ atrophied | 1 | — | — |
| | „ vascular | — | 4 | — |
| | Osseous walls carious | 2 | — | — |
| | „ canal contracted | 2 | — | — |
| Membrana Tympani | White, and thicker than natural | 30 or $\frac{1}{6}$ | 4 or $\frac{1}{17}$ | 11 or $\frac{1}{32}$ |
| | Very concave externally | 7 or $\frac{1}{25}$ | 3 or $\frac{1}{23}$ | 4 or $\frac{1}{89}$ |
| | Flat | 1 | — | — |
| | Vascular | 4 | — | — |
| | Thick and vascular | — | — | 3 |
| | Contains a deposit of calcareous matter | 4 | — | — |
| | Presents an orifice | 12 | — | — |
| | One half destroyed by ulceration | 4 | — | — |
| | Three fourths „ „ | 13 | — | — |
| | All „ „ | 12 | — | — |
| | Very concave and adherent to promontory | 15 | 6 | — |
| | Connected with promontory by bands | 11 or $\frac{1}{7}$ | 9 or $\frac{1}{8}$ | 16 or $\frac{1}{22}$ |
| | Adherent to stapes | — | 3 | — |
| | Connected with stapes by bands | 2 | — | 5 |
| | Has an orifice through which the stapes projects | — | 1 | — |
| | Nearly destroyed; the remnant adherent to promontory | 9 or $\frac{1}{20}$ | — | — |
| | Connected with the stapes and promontory by bands | 3 | — | 1 |
| | Connected with incus by bands | 1 | — | — |
| | Adherent to incus | — | 1 | 6 |
| | Connected with all the ossicula by bands | 1 | 1 | — |
| | Connected with all the ossicula and the promontory by bands | — | 3 | 3 |

| | | | Cases of Deafness. | Cases of Probable Deafness. | Cases of Incipient Deafness. |
|---|---|---|---|---|---|
| Cavitas Tympani | Contents | A collection of mucus: the membrane healthy | 19 or $\frac{1}{9}$ | 11 or $\frac{1}{6}$ | 13 or $\frac{1}{27}$ |
| | | A collection of mucus: the membrane thick | — | — | 5 |
| | | A collection of cerumen | 1 | — | — |
| | | „ epithelium | 1 | — | — |
| | | „ pus: muc. memb. thick | 15 | — | — |
| | | „ blood | 1 | 1 | 2 |
| | | „ lymph | 1 | 1 | 1 |
| | | „ serum and lymph | — | — | 1 |
| | | „ serum | — | 5 | 4 |
| | | „ scrofulous matter | 11 | 3 | 6 |
| | | „ oily matter | 1 | — | — |
| | | „ calcareous matter | 2 | — | 5 |
| | State of Mucous Membrane | More vascular than natural | 17 or $\frac{1}{10}$ | 21 or $\frac{1}{3}$ | 28 or $\frac{1}{13}$ |
| | | Thicker than natural | 73 or $\frac{1}{3}$ | 35 or $\frac{1}{2}$ | 71 or $\frac{1}{5}$ |
| | | So thick as almost to bury the whole of the stapes | 8 | 14 | — |
| | | „ „ to fill the tympanum | 5 | 3 | — |
| | | Ulcerated and thick | 12 | 6 | 2 |
| | | Pulpy | — | 4 | 1 |
| | | Black pigment secreted beneath it | — | — | 2 |
| | | Effusion of blood beneath it | — | — | 8 |
| | | „ serum beneath it | — | — | 1 |
| | Bands of adhesion between | Stapes and promontory: muc. mem. healthy | — | 9 | 66 |
| | | Stapes and promontory: muc. mem. thick | 18 | — | 30 |
| | | Stapes and promontory: muc. mem. vascular | — | — | 6 |
| | | Stapes, promontory, and pyramid | 1 | — | — |
| | | Incus and promontory | 4 | — | 1 |
| | | Incus, stapes, and promontory | — | — | 3 |
| | | Malleus and promontory | 3 | 3 | — |
| | | „ and stapes | — | — | 1 |
| | | „ stapes, and promontory | — | 1 | 4 |
| | | All the ossicles | 13 | — | — |
| | | „ and the promontory | 3 | 1 | 5 |
| | | Tensor tympani muscle and stapes | — | — | 3 |
| | | Chorda tympani nerve and incus | — | — | 1 |
| | | Chorda tympani nerve, incus, stapes, and promontory | — | — | 2 |
| | | Chorda tympani nerve and upper wall of tympanum | — | — | 1 |
| | State of the Ossicula | Malleus: Adherent to promontory | 1 | — | — |
| | | Malleus: Removed by absorption | 1 | — | — |
| | | Malleus: „ ulceration | 3 | 1 | — |
| | | Malleus: Partly destroyed by caries | 1 | — | — |
| | | and incus in mastoid cells | 1 | — | — |

| | | | | Cases of Deafness. | Cases of Probable Deafness. | Cases of Incipient Deafness. |
|---|---|---|---|---|---|---|
| Cavitas Tympani (*continued*) | State of the Ossicula (*continued*) | Incus | Removed by absorption | 3 | — | — |
| | | | „ ulceration | — | 1 | — |
| | | | Partially absorbed . | 4 | 1 | — |
| | | | Partially removed by caries | 1 | — | — |
| | | | Disconnected from stapes | 1 | 1 | — |
| | | | Disconnected from stapes and malleus . . . | — | 1 | — |
| | | Stapes | The base anchylosed to the fenestra ovalis | 14 | 2 | — |
| | | | „ partially do. do. | 10 | — | — |
| | | | „ attached to fenestra ovalis more firmly than natural | 3 | 1 | — |
| | | | „ absorbed . | 1 | — | — |
| | | | „ disconnected from fenestra ovalis | — | 1 | — |
| | | | Crura absorbed . . | 1 | — | — |
| | | | Base projecting into the vestibule . . . | 1 | — | — |
| | | | Disappeared from ulceration | 2 | — | — |
| | | All the Ossicula | Removed by ulceration | 2 | — | — |
| | | | Disconnected . . | 1 | — | — |
| | | | Carious . . . | 2 | — | — |
| | Osseous Walls of Tympanum . | | Thickened . . . . | 1 | — | — |
| | | | Carious . . . . | 2 | — | — |
| | | | Upper wall partially deficient | 10 | 12 | 32 |
| | | | Lower wall „ „ | 5 | 4 | 13 |
| | | | Carotid canal contracted . | 3 | — | — |
| | Membrane of Fenestra rotunda | | Red and pulpy . . . | 1 | — | — |
| | | | Bands of adhesion covering it | 1 | — | 3 |
| | Tensor tympani Muscle . . . | | Atrophied . . . . | 6 | 1 | — |
| | | | Attached to stapes . . | 1 | — | — |
| | Eustachian Tube | | Contains mucus . . . | 2 | — | 8 |
| | | | „ lining memb. vascular . . | 1 | — | — |
| | | | „ lining memb. thick | 2 | — | — |
| | | | Lining membrane congested . | — | 2 | 3 |
| | | | Bands of adhesion connecting the parietes . . . . | — | — | 3 |
| | Internal Ear . . | | Membranous labyrinth thickened | 4 | — | — |
| | | | „ „ atrophied | 6 | — | — |
| | | | Labyrinthine fluids deficient | 8 | — | — |
| | | | Vestibule and cochlea contain bloody serum . | 1 | — | — |
| | | | „ full of pus . . | 1 | — | — |
| | | | A membranous band extending across the vestibule . . | 1 | — | — |

A CASE OF

# APOPLEXY OF THE CEREBELLUM.

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Received Jan. 29th.—Read March 13th, 1849.

Apoplexy is a disease of so frequent occurrence that some apology may be necessary for submitting to the notice of the Society the details of an individual case. Still every contribution to the pathology of the nervous system is important, and individual cases become invested with a special interest, where the opportunity has been afforded of watching the patients during life, and of investigating the pathological conditions after death. It too often happens that fatal cases of apoplexy present us with no previous history for afterthought. We are suddenly called, the patient has been as suddenly seized;—the loud or deep stertor and profound coma may indeed at once reveal to us, on our approach, the real character of the disease before us, and the post-mortem inspection (when it can be obtained) demonstrate the seat of the rupture, and the extent of the effusion; but the previous history is wanting to give to these their full significance.

The subject of the present communication was a man 52 years of age, of a spare habit, and nervous temperament, of considerable mental energy, and active business habits. He was by trade a printer and publisher. For many years he had been afflicted with an amaurotic affection, which had materially impaired his sight, and latterly to such an extent, that he could recognise his friends only when they were very near to him, and could not read without the aid of a magnifying glass.

I was first called to attend him in June 1843, though,

for several years, as the medical attendant of his family, I had had constant intercourse with him. He was then suffering from an attack of cephalæa. The pain through his temples was agonising, and there was considerable febrile disturbance. As he had some time previously been under the care of Mr. Guthrie for his eyes, and was seriously alarmed about them, I had the benefit of a consultation with Mr. Guthrie on his case. Under the influence of topical bloodletting and a strict antiphlogistic treatment, the attack subsided, but the sight was more impaired, and it was long before he regained his wonted energy and strength. About two years ago he became unfortunate in business and embarrassed in his pecuniary affairs. The anxiety and harass of mind to which he was subjected, under a commission of bankruptcy, shook his whole nervous system, and he had never afterwards the same physical energy as before. Despondent and subject to emotional excitement on the slightest occasion,—bursting into a flood of tears when allusion was made to his wife and family, to whom he was tenderly attached,—he lost his former aptitude for business, became irritable in temper, and lethargic both in body and in mind. His mental powers seemed weakened, and his memory was greatly impaired; indeed to such an extent that he not unfrequently forgot the very business he had purposely left home to execute, and if he happened to have two commissions on hand, he generally forgot the more important one.

Such had been the general state of his health for some months, when I was hastily called to him in the morning of the last day of April of the past year. He had been seized with sickness and faintness during the night, and on getting out of bed to pass water had fallen down, as it was thought, in a fainting fit. I found him low and exhausted, with a feeble pulse, and a cold clammy perspiration upon the surface of the body, complaining of sickness of stomach, and of pain, heat, and uneasiness in the back part of his head. I gave him ammonia with Hoffman's anodyne, and he rallied in the course of the day, but the pain, heat, and uneasiness of the head continued for some days afterwards. There was

no paralysis on either side, but there was about him a hurriedness of manner, great restlessness and irritability of temper. He did many strange and unaccountable things, such as getting up in the middle of the night and putting on his clothes, then going to bed again half dressed, and other like vagaries. His emotional excitability had increased, and was at times distressing to every one about him. His appetite was good, better than it generally had been, and it continued good up to the time of his death, but his mental faculties were evidently becoming weaker, and I was strongly impressed with the conviction that he was the subject of ramollissement of the brain. I had a consultation on his case with Dr. Cobb on the 3d of May. A few days afterwards his wife told me with great delicacy and embarrassment of manner that he had become the subject of a constant desire for sexual intercourse. His behaviour in this respect was so different from what it had been, and so little amenable to persuasion or reason, that she said necessity had induced her to speak on the subject to me. I at once recommended his removal from home, and succeeded in persuading him to pay a visit to some friends in the country without his wife, on the plea that a change of air and scene was essentially necessary for the re-establishment of his health. He left London on the 14th of May, and was absent about three weeks.

He returned looking better, apparently improved in his general health, and no longer, as I afterwards learned from his wife, a slave to the sexual propensity. In this respect he had greatly changed. The desire for sexual intercourse had abated, and from this time it gradually became less and less to the period of his death, which took place on the 6th of September following. In the interval his health seemed stationary, but there was observed an unsteadiness in his gait, which visibly increased, and amounted at times, under the influence of emotional excitement, to the staggering of a drunken man; and for some time before he died he had a settled weakness and stiffness in the left leg and foot. He was apathetic and lethargic, sleeping half his time away, with less aptitude and greater indifference for business.

On the 6th of September after having eaten a hearty

dinner, he was seized with severe pain in the back part of his head. He described the attack, after rallying a little, as though he had received a sudden blow upon the part. It was immediately followed by faintness, sickness, and vomiting. He brought from his stomach all he had eaten, and rallied a little, so far as to request that I might be sent for, and to be able to describe how he had been attacked. Soon afterwards he became restless and irritable, and then had a severe convulsive rigor, which was followed by coma with stertorous breathing, and a feeble, fluttering pulse. He gradually sunk and died in less than four hours from the time of the attack.

*Post-mortem examination, forty hours after death.*—The vessels on the surface of the brain were found distended with dark black blood. The brain itself presented an unhealthy aspect. The convolutions shrunken in size, and wanting firmness of texture, were of a dingy yellow hue, approaching to the colour of whity-brown paper.

The optic nerves had the same shrunken character, and dingy hue, and on tracing them from the chiasma through the optic tracts into their cerebral connexions, they and the surrounding substance were found to be in a state of whitish gray softening; the whole region of the mesocephale had an unhealthy aspect, and on its outer surface were seen patches of the same whitish-gray degeneration. The anterior of the right hemisphere of the cerebellum had become a softened pulpy mass, in the midst of which was found an apoplectic clot, of the size of a pullet's egg, from the rupture of one of the branches of the vertebral artery. The softening had extended inwardly beyond the centre of the median lobe, implicating the fibrous strands of the middle and inferior planes in the destructive process, and outwardly so near to the surface of the hemisphere, that a portion of the apoplectic clot was projecting through it. Some extravasated blood was found in the lateral ventricle, especially on the right side. The whole arterial system of the brain was more or less in an unhealthy state, presenting that diseased condition of the vessels which results from cartilaginous and ossific deposition between their coats. In the

vertebral arteries this was remarkably apparent:—there was seen, at very short distances from each other, a succession of osseous rings, while on the right side the vessel was enlarged, and upon its cerebellar branch, in which the rupture appeared to have taken place, there were whitish raised patches of cartilaginous deposits. Such a condition of the vessels, from the disturbance it would occasion, in the circulation through the brain, must have given rise to great functional derangement, and was, in all probability, I think, the primary cause of disease. The case presents an apt illustration of that second form of apoplexy, which Dr. Abercrombie has so admirably portrayed, and it offers some points of curious interest, which from their physiological bearing deserve consideration.

And 1st, as to the nature of the attack which the patient had on the last day of April. From the diseased condition of the arteries of the brain, and from the symptoms at the time, there is every reason to believe, that the attack, though slight, was of the same nature as that of which he died. But, whatever may have been its precise character, one thing is certain, that from this time symptoms of an inflammatory kind pointed to the back part of the head, as a *seat* of disease, for *pain, uneasiness,* and *heat of surface* were localized there. It is no uncommon thing to find in a central part an apoplectic cyst surrounded by softening of the adjacent substance, and we know that the consecutive inflammation which accompanies hemorrhages and direct extravasation, leads to cerebral degeneration as a consequence.

2d. The condition of the cerebellum viewed in connexion with the history of the case, is full of interest. For while it is obvious that such an extensive disorganization of its internal structure must have destroyed the integrity of all the functional powers of the part, it is highly interesting to note, during the progress of the degeneration, first, the exaltation and subsequent depression of the generative function, and secondly, the tottering gait, from the defective power of co-ordination, ending in a weak and stiffened limb.

It is true that emotional excitability was a prominent

feature in his case, and that the mental faculties became much impaired. The pathological condition of the mesocephale and of the great hemispherical ganglia may be adduced in explanation of these symptoms, but the extraordinary excitement of the sexual passion was a sudden invasion, and manifesting itself as it did, so soon after his seizure in April, the inference appears to be indisputable that it was a consequence of that attack, and dependent upon the irritative stage of that destructive disturbance of the cerebellum which led to such extensive degeneration of its structure.

This is not the only case in which from personal observation I have been able to associate exaltation and subsequent depression of the sexual propensity with opposite pathological conditions of the cerebellum; the first, with irritation and incipient inflammatory indications, and the latter with degeneration and abscess.

In one instance, which came under my notice some years ago, the patient, though doatingly fond of his wife and children, and in every other relation of life an exemplary man, could not restrain the sexual passion, and I had him two or three times to treat for gonorrhœa,—on one occasion, during the period of his wife's accouchement. He wept over his delinquencies. In his case, at the latter period of his life, and after all erotic manifestations had passed away, he had not only a tottering, but a stooping gait, and required a walking-stick for support in progression. After death there was found an extensive softening in the middle and one of the lateral lobes of the cerebellum, as well as superficial ulceration of the glans penis, and atrophy of the genital organs.

These cases point to another function of the cerebellum, and connect the motor phenomena and the defective co-ordinating power in maintaining the equilibrium of the body, with the deep-seated disorganization of its fibrous structure. To my mind, the evidence from pathology and comparative anatomy is irresistible, that the cerebellum is subservient to the co-ordination of voluntary and locomotive actions. It has been well observed, "No other part of the

encephalon has such extensive connexions with the cerebro-spinal axis. It is in union with each segment of the great nervous centres upon which all the movements and sensations of the body depend. The antero-lateral columns of the cord, and the anterior pyramids and olivary columns, supplying all the anatomical conditions necessary for the development of acts of sensation and volition."* It is intimately associated with the optic, the anterior and posterior cerebral, and the great hemispherical ganglia, through the medium of the inter-cerebral commissure.

At the same time, it is admitted, we have little exact knowledge of its intimate structure. The complexity of the organ, consisting as it does of a series of ganglia, involves the belief of a plurality of functions, and one thing is certain, that the median lobe is *primitive* and *fundamental,* and that it exercises an *independent function,* since in the lower classes of the animal series up to birds, *the lateral lobes do not exist.* This fact, though fatal to the hypothesis of Vimont, which locates the sexual instinct in the lateral hemispheres, does not affect the allocation of Serres, who, from pathological researches, fixes its seat in the central lobe, in support of which my own cases may be adduced as corroborative proof. It cannot be disputed that the generative instinct is primitive and fundamental; and seeing that we have distinct olfactive, optic, and auditory ganglia, à priori reasoning inevitably leads to the conclusion that the instinct of propagation, one of the most universal instincts in nature, and having for its object the perpetuation of the species, should have a special sensory ganglion of its own. This sensory ganglion of the sexual instinct I would rank in the same category with the optic, auditory, and other sensory ganglia; and to its allocation in the central lobe of the cerebellum, I can see no valid anatomical or physiological objections. I cannot subscribe to the opinion that "the generative function is scarcely such as to require in its central organ connexions so extensive as those possessed by the cerebellum;" nor to the notion that, for the manifesta-

* Dr. Todd and Mr. Bowman, Physiological Anatomy and Physiology of Man.

tion of this complex propensity in man, "it is not likely that its organ would be connected with any other part of the spinal cord, than that from which nerves are derived to the organs of generation."*

In the consideration of this subject we must not lose sight of the distinction between *instinct* and *propensity*, which has been so clearly pointed out by my friend Dr. Carpenter in his able analysis.

"*Instinct* being our expression for a certain series of phenomena directed towards a given purpose, but not really involving any other physiological or psychological actions than sensations and respondent movements, and *propensity* being a *desire* for *gratification* involving an *idea* of the object;" it follows, as Dr. Carpenter has justly observed, "that the *absence of the cerebellum* in insects is not inconsistent with the doctrine of *Gall*, since their sexual actions may be purely *consensual;* neither is it opposed to that of Flourens, for all these movements are evidently of a *consensual* and *reflex character*."

I think, with Dr. Carpenter, that the sensory ganglia are evidently the instruments by which instinctive and consensual actions are performed, and that they are also the seat of the simple or elementary feelings of pleasure and pain, connected with their respective functional endowments. And thus in the lower tribes of animals, whose instincts are not restrained or directed by intelligence, the sexual instinct is exalted into action by the direct operation of internal sensations, and all the respondent movements are consensual. *Where there is no cerebrum there is no cerebellum.* But where the desire for the gratification of the sexual propensity involves both sensorial pleasure and an idea of the object, we there find both *cerebrum* and *cerebellum*, and in the latter a *sensory ganglion*, in most intimate connexion with the *great centres of sensation and emotional feeling*, and through them, with *those of intellectual action;* thus affording, from its anatomical and physiological relations, a ready and satisfactory explication of the complex character of the amative propensity in man.

* Todd and Bowman, loc. cit.

# REMARKS

ON

# THE CAUSES AND MORBID ANATOMY

OF

# MENTAL DISEASES.

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Having communicated to the Society two papers on the Statistics and Pathology of Mental Diseases, which the Council did me the honour to publish in the 26th and 28th volumes of the Transactions, I am induced again to lay before the Fellows the present communication, as a further exposition of the subjects then discussed; in the hope that the sixty-seven additional dissertations now recorded may be considered of sufficient interest to form an appendix to the 108 autopsies of insane patients already reported. To these pathological illustrations of so important a class of disease, some general remarks respecting the apparent or assigned causes of insanity are prefixed; and as the deductions advanced have been derived from an examination of a large number of lunatic patients, the particulars of whose cases were carefully registered at the period of their admission into Bethlem Hospital, I hope the details now given may be considered of sufficient value to merit perusal, and believe they will, at least, prove of some use to other investigators.

First, I would observe, that of the 1798 curable lunatics recived into the above institution, during six years ending the 31st of December last, 1094 were female, and only 704 male, patients. These numbers show an excess of 390 individuals or 55·39 per cent. of the former over the latter sex,

and exemplify the greater liability of women than men to attacks of mental disease.

By most psychologists, the causes apparently producing attacks of mania, are divided into moral and physical, to which hereditary tendency is also added. The last variety, however, is frequently coexistent with some cause comprised in either of the two previous categories. When such complications prevail, the effects become more pronounced, and maniacal attacks are more likely to supervene. Wherever hereditary tendency to insanity exists, especially if both parents are so tainted, the children become liable in a greater degree to the causes producing mental alienation, than parties otherwise constituted; and this often explains the occurrence of mania in particular instances, as the exciting causes then exert a more powerful influence.

Of the 704 male lunatics now recorded, mental disease was induced by moral causes in nearly one half the entire number, or 346; whilst of the 1094 female lunatics, the proportion was not quite so large, being 489 individuals, or 44·69 per cent. From such data it appears that half the cases of insanity arose from moral influences. On the other hand, respecting physical causes, amongst the 704 male lunatics, 156, or 22·15 per cent., originated from that source; whereas amongst the insane females, the proportion was somewhat greater, being 282, or exactly 25·77 per cent.

On investigating more minutely the cases of the 1798 patients, it appears, that amongst the 346 males who became insane from moral causes, the disease in 86 individuals, or 24·85 per cent. originated from reverse of fortune. The next most influential moral cause affecting males was anxiety, of which 69 instances are enumerated, being 19·67 per cent. Religion follows afterwards, and furnished 45 cases, or 13 per cent. Then love, from which mental emotion, 18 examples of insanity are registered, or 5·49 per cent.; and lastly, fright, which gave 13 cases among the male patients attacked by madness.

Contrasted with this summary of moral causes acting upon men, it may be interesting to advert to the 489 insane

females classed under the same division. Here anxiety holds the first rank, seeing it produced mania in 79 cases, being at the rate of 16·15 per cent. Then religion, to which 69 instances, or 14·11 per cent., are assigned. Loss of relatives furnished 62 cases, or 12·67 per cent.; whereas, in male patients, only 14 examples of the same description were observed. Love follows next, by which influence 57 females, or 11·65 per cent., were reported to have lost their reason; thus making upwards of double the number, comparatively speaking, of cases of insanity occasioned by Cupid's tender passion upon their more susceptible imaginations, than upon men. Fright produced mania in 50 women. Reverse of fortune in 49, or only 4·51 per cent.; whereas, amongst insane males, the ratio was nearly treble that amount.

In regard to the physical causes producing insanity in men, of the 156 individuals so affected, 80 originated from intemperance, being upwards of half the total amount of patients belonging to this division; whilst 24 cases, or about one sixth, arose from previous physical disease, or injuries of the head. Again, amongst the 282 female lunatics whose mental malady was produced by physical causes, the largest proportion became insane from puerperal disease; 117 examples of that complaint being enumerated, or 41·70 per cent. Affections of the uterine organs rank next, and furnished 53 examples, or 18·79 per cent; whilst, under the head of intemperance, instead of one half the cases arising from physical causes, being so classed, as in men, not more than 35 instances of insane women arose from the immoderate use of intoxicating liquors, being at the rate of only 12·40 per cent., in place of 51·28 per cent., as in the other sex.

Many other causes, both moral and physical, producing insanity in both sexes, such as domestic unhappiness, intense study, excessive application to business, false accusations, sensual excess, nervous diseases, and so forth, might be detailed; but it is almost superfluous. I cannot, however, avoid noticing two peculiar influences which produced insanity in males; namely, the loss of law-suits, and political

excitement. From the former, 4 male patients became mad, in consequence of the harassing legal proceedings to which they were subjected; while from political excitement, unlike the results lately noticed in France, Italy, and Germany, only four instances have been met with amongst the total curable lunatics admitted, during the last six years, into Bethlem Hospital.

Hereditary predisposition to mental disease, as it appeared amongst the 1798 insane persons comprised in the present category, is the next point to which I would direct attention. Nearly one third of the number, or 609 individuals, were ascertained to have such tendency, the largest proportion being, however, female patients. Thus, amongst the 704 male lunatics admitted, only 219, or 31·10 per cent., were hereditarily predisposed; whereas, of the 1094 female lunatics, 390, or 37·47 per cent., were of that description. This feature becomes more interesting, when it is remembered, that insanity is a disease more frequently transmitted to offspring by the mother than by the father; whilst mothers also transmit this disease oftener to their female than male children.

Respecting the curability of insanity, I would remark, that, in male lunatics, the mental disease, *cæteris paribus*, proved more curable where the attack was produced by pecuniary embarrassments than it did when originating from any other moral cause; and next where the malady arose from religion. But amongst female lunatics, the cases in which love was the assigned cause, occupied the first rank in the ratio of curability; and these were followed by the cases due to religion. Again, with reference to physical causes producing mania, the attack seemed most curable when it arose from intemperance, in male insane patients; but, in females, a more favorable prognosis might be predicted in cases of puerperal insanity, than in almost any other variety of mental alienation.

In regard to the period of life when mental disease supervened, amongst the 704 male lunatics referred to, the largest proportion became insane between the ages of 30 and 40; the

number at that period of life being 218, or 30·96 per cent. But, in females, the attacks occurred earlier; 309 of the 1094, or 28·24 per cent., being from 20 to 30 years of age. With reference to the civil condition of patients, more married persons were affected by insanity than single, particularly males; whilst a larger proportion of widows were attacked than widowers; the single of both sexes being nearly equal, as is shown in the following table:

Civil Condition of the Curable Lunatic Patients admitted into Bethlem Hospital.

| | MALES. | FEMALES. |
|---|---|---|
| Married . . | 375 or 53·26 per cent. | 543 or 49·63 per cent. |
| Single . . . | 304 or 43·18 per cent. | 464 or 42·61 per cent. |
| Widowed . . | 25 or 3·55 per cent. | 87 or 7·95 per cent. |
| Total . . | 704 | 1094 |

Before detailing the morbid appearances met with in the following 67 dissections, I would state, that subsequent experience has confirmed the views promulgated in my two previous papers, published in the Society's Transactions, respecting the appearances met with in the brains of lunatics after death; namely, that the opinions of those psychological physicians, who are denominated "the anatomists," is the only true doctrine, and not the views entertained by the "vitalists." The former section consider the diseased alterations of structure observed in the brain to produce the attacks of insanity; whilst the latter believe them to be only consequences. According to my judgment, the numerous illustrations contained in the present and previous communications, distinctly show, that the evidence greatly preponderates in favour of the anatomists, whose conclusions not only appear the most rational, but fully explain the phenomena observed during the patient's life; whilst such opinions are more consistent with the present advanced state of pathological knowledge respecting mental diseases.

## SYNOPSIS OF DISSECTIONS.*

No. 1.—F., æt. 48. In hospital two years and two months.

*Head.*—External vessels quite empty; cranium thick, dense, and heavy; vessels of dura mater extremely turgid; membrane on right side of head lined nearly throughout by an adventitious layer, as thin as tissue paper, but thicker in some places. This structure was of light reddish tint, easily lacerable, free and smooth on inner surface, having four or five ecchymoses in different situations. Very slight serous infiltration of pia mater. About ℥iss of turbid fluid in each lateral ventricle; and the fornix was so far raised, that the foramen of Monro formed a direct communication between both cavities. Vessels of brain generally full of blood; cerebral substance firm.

*Chest.*—A single band of adhesion on right side; lower lobe of left lung connected by a very firm fibrous texture, of small extent, to a part of the chest, where three or four ribs had been formerly broken, and where a considerable bony projection existed.

*Abdomen.*—Gall-bladder contracted, and completely filled with biliary concretions of various sizes.

No. 2.—F., æt. 70. In hospital forty-two years.

*Head.*—External vessels quite empty, but those of brain and membranes turgid; skull-cap heavy, with a livid appearance internally, from vascular congestion; serous infiltration of pia mater covering hemispheres; blood-vessels in cerebral substance everywhere full; and more than ℥ss of fluid in each lateral ventricle.

*Chest.*—Slight recent inflammation of left pleura, with partial effusion of soft yellow fibrine, and partial agglutina-

* When the chest or abdomen are not mentioned, it should be understood, that no diseased alterations of structure were observed in either of these cavities.

tion of opposed surfaces; mucous membrane of trachea and bronchi generally congested; general and firm adhesions of right lung, which was softish, livid, nearly black, and exhaled an offensive odour.

No. 3.—M., æt. 30. In hospital seven months.

*Head.*—Dura mater distended with air, bubbles of which were also seen in all the meningeal vessels; arachnoid membrane thickened and opaque; considerable serous infiltration of pia mater; substance of brain firm; moderate serous effusion in ventricles.

*Chest.*—Firm adhesions of both pleura, especially at posterior part; about a pint of sero-purulent fluid in right cavity, and a smaller quantity in that of left pleura; both lungs studded with tubercles of various sizes, and numerous cavities in upper lobes; pericardium distended with fluid; heart much enlarged; right ventricle dilated; walls flabby; and right auriculo-ventricular opening admitted four fingers.

*Abdomen.*—Liver much enlarged, and its anterior margin extended as low as the umbilicus; numerous small tubercular deposits scattered over peritoneum, and larger masses about intestines; mesenteric glands much enlarged; and numerous ulcerations in small intestines, especially at lower part of ileum.

No. 4.—M., æt. 69. In hospital forty-two years.

*Head.*—Blood-vessels of cranium, membranes, and brain, particularly the latter, very turgid; medullary substance full of bloody points, wherever it was cut into; arachnoid membrane thickened and opaque, especially along the sides of great fissure of cerebrum, which was slightly milky over whole hemisphere; considerable infiltration of pia mater, with some increase of fluid in ventricles.

*Chest.*—Partial adhesions in both lungs, of some standing; strong and close old adhesion of pericardium to right auricle and root of aorta.

*Abdomen.*—Right kidney shrunk to one third its natural

size, and slight diminution of left, a serous cyst in each kidney; fat condensed and closely adherent to fibrous capsule of kidney on both sides.

No. 5.—M., æt. 46. In hospital eight years and two months.

*Head.*—All the vessels of skull, membranes, and brain very full; those of cerebral substance large and numerous in all parts, and must have been extremely distended before the large effusion of blood, which took place on opening the head; slight infiltration of pia mater on convexities of cerebral hemispheres.

*Chest.*—Slight old adhesions of lungs, with some fluid in each pleura.

No. 6.—F., æt. 45. In hospital six months.

*Head.*—Internal vessels of head quite empty; those of brain and membranes moderately turgid; a very faint claret-tint discoloration, in a few places, but of small extent, in medullary substance of hemispheres; very slight infiltration of pia mater, and about ℥ss of perfectly pellucid and colourless fluid in lateral ventricles.

*Chest.*—Small congeries of tubercles, apparently recent, and about the size of a nut, in one lung; with one tubercle, the size of a pea, in the other.

*Abdomen.*—Mucous membrane of small intestines dark-coloured from vascular congestion, most marked in jejunum, but less so in ileum; similar discoloration, to a greater extent, in cæcum and colon; but the existence of ulceration was not clearly made out, the mucous surface appearing entire.

No. 7.—M. æt. 35. In hospital two years

*Head.*—External vessels of head quite empty; those of membranes and brain universally turgid. Arachnoid over whole brain, but more particularly on cerebral hemispheres, thickened and opaque; opacity being, for the most part, general, but in some situations dotted. Great infiltration of pia

mater, converting it into a thick spongy layer, which completely concealed the convolutions. Increased vascularity of cerebral substance, and about ʒii of limpid fluid in each lateral ventricle.

*Chest.*—Left lung tuberculated about half its substance, with several small caverns.

*Abdomen.*—Liver slightly hardened throughout, rough on surface, and presenting, when cut into, the nutmeg appearance. Investing membrane thickened and opaque. Gall-bladder completely empty, and contracted to a small size; cystic duct impervious; no tinge of bile either in that duct or gall-bladder.

No. 8.—M. æt. 32. In hospital fifteen days.

*Head.*—Much blood escaped in sawing bone and removing skull-cap. In the cavity of arachnoid, considerable quantity of blood, partly fluid, and partly coagulated. The former was generally diffused, discolouring the whole surface of cranial contents. The coagulum perfectly dark and closely adherent, covered dura mater extensively over left, middle, and posterior lobes, forming a layer about quarter of an inch in thickness. It was found in smaller quantity on dura mater of occipital fossæ, over the right posterior lobe, and in the right middle fossa of the basis cranii. All the vessels of brain extremely turgid; and bloody points very numerous, wherever cerebral substance was cut into.

*Chest.*—Right lung universally connected to parietes by old adhesions. Posterior lobe of left lung, for a considerable portion in congestive stage of inflammation.

*Abdomen.*—Omentum thickened, dark coloured, and gathered into a mass, covering the transverse portion of colon, was connected to abdominal parietes by close recent adhesions, thus dividing the abdomen into two distinct cavities. In the lower a considerable quantity of dark, thick, fluid blood, about ʒiij in cavity of pelvis; and all the small intestines were covered, as if smeared over with the same fluid, but no break of surface could be discovered. Between under-surface of liver, and superior part of omentum and colon,

there was a cavity, bounded by recent adhesions of neighbouring parts, and containing about ℥ij of a thickish puriform fluid, slightly stained with blood, and some soft fibrine. Substance of liver presented a rupture about half an inch deep, beginning on the edge, at attachment of round ligament, and extending for two inches along concave surface.

No. 9.—F. æt. 45. In hospital five years and three months.

*Head.*—Skull-cap very thick and heavy; dura mater firmly attached to its inner surface; arachnoid dry, and slightly opaque, and small amount of subserous infiltration; cerebral substance firm and bloodless; ventricles contained a few drachms of clear fluid.

*Chest.*—Both lungs somewhat emphysematous, the apices being irregularly puckered, and united by old adhesions to opposed surfaces of pleuræ; ℥iij of yellowish fluid in pericardium; heart considerably dilated, especially at right side, and the right auriculo-ventricular opening admitted three fingers.

*Abdomen.*—Ovaries were irregular, white looking masses, when divided, appeared like a fibrous nucleus surrounded by cells of various sizes, containing a clear fluid.

No. 10.—M. æt. 46; in hospital two years and six months.

*Head.*—Arachnoid thickened and opaque over whole extent of cerebral hemispheres; considerable serous infiltration of pia mater. General fulness of blood-vessels, and increased vascularity of cerebral substance; and about ℥iij of clear fluid in lateral ventricles.

*Chest.*—Nearly a pint of serous fluid in right pleura; both lungs connected to thoracic parietes by partial old adhesions, at upper and back part; puckering, with partial depressions of surface of each lung, about apex; induration of pulmonary substance, with partial suppurations, under depressions; and neighbouring pulmonary substance in the state of congestive pneumonia.

*Abdomen.*—A few slight ulcerations of mucous membrane of ileum; and vascular congestion of that of large intestine.

No. 11.—F., æt. 42; in hospital seven years.

*Head.*—Skull-cap very vascular; and dura mater firmly attached to bone. Arachnoid opaque and spotted, especially on left half; considerable serous effusion; substance of brain very vascular; about ʒiv of clear serous fluid in ventricles; foramen of Monro large and round.

*Chest.*—Several ounces of yellow fluid in cavities of both pleura; their opposed surfaces united by old adhesions, especially at upper part of chest. Numerous and large tubercular cavities in upper part of left lung; the lower part of which, and whole of right lung, studded with small tubercles, the intervening pulmonary substance being, however, healthy and pervious to air. A little recent lymph effused at base of right lung; some fluid in pericardium, and heart pale.

*Abdomen.*—Considerable effusion of yellow fluid in cavity of peritoneum; abdominal viscera remarkably bloodless; and ovaries reduced to small irregular fibrous bodies.

No. 12.—F., æt. 46; in hospital one month.

*Head.*—External vessels bloodless; internal turgid, particularly those distributed through cerebral substance; arachnoid over hemispheres slightly and partially milky; considerable infiltration of pia mater; between one and two ounces of limpid fluid in each lateral ventricle.

*Chest.*—Old adhesions of inconsiderable extent at anterior part of each lung; and apex of left lung firmly adherent. Partial corrugated depressions of its surface, with induration of its subjacent tissue, so that it sunk in water.

*Abdomen.*—Viscera almost universally adherent to each other and to abdominal parietes by old adhesions; liver adherent to diaphragm, colon, and stomach; spleen connected to neighbouring organs; arch of colon and convolutions of small intestine also connected together. These adhesions appeared of ancient date.

No. 13.—F., æt. 40; in hospital ten years and eleven months.

*Head.*—Vessels of membranes and brain, particularly those of cerebral substance, extremely turgid.

*Chest.*—Posterior portions of both lungs very dark coloured, a small portion of one being deeply congested, and so firm as to sink in water.

*Abdomen.*—Upper and middle parts of cavity occupied by cæcum, and adjoining portion of ileum enormously distended, and nearly concealing rest of intestines. Enlarged cæcum of a dark livid red from vascular turgescence, and in parts of a greenish hue, the precursor of mortification. This portion of intestine, instead of being bound down in iliac fossa, was entirely covered by peritoneum, and consequently lower than usual; it had become twice twisted on itself, so that a thick ridge of mesentery pressed firmly on it and adjacent portion of ileum, and had entirely obstructed intestinal canal.

No. 14.—F., æt. 55; in hospital five years and one month.

*Head.*—Slight partial opacity of arachnoid; infiltration of pia mater; inconsiderable effusion of fluid in ventricles, and encephalon rather pale.

*Chest.*—Trifling old adhesions of lungs.

*Abdomen.*—Convex surface of liver connected nearly throughout to diaphragm, and its inferior aspect less generally adherent to adjacent parts. Whole tract of small intestine formed by close general adhesions into one mass, to which large intestine partially adhered. Peritoneal covering of these viscera closely studded with small, white, firm, and flattened tubercles; but peritoneum lining parietes less generally affected in same manner. A considerable portion of adherent convolutions, and connecting adhesions of a black colour, and spots of a similar tint on peritoneal surface of large intestine, where it was not adherent. This discoloration was not from decomposition. Lower edge of great omentum adhered firmly to bladder, and serous covering of that organ presented a few tubercles.

No. 15.—F., æt. 19; in hospital one year and two weeks.

*Head.*—External vessels empty; those within being more full, but not particularly turgid; very slight infiltration of pia mater on hemispheres; quantity of fluid in ventricles inconsiderable; and some watery fluid in base of skull, after brain was removed.

*Chest.*—Left lung connected to chest, in its whole surface, by old adhesions; right lung contained two hard tubercles, each about the size of a large pea, imbedded in substance near its surface. When divided, they consisted of firm, grayish, and apparently inorganic matter, breaking down under strong pressure; it could be scraped out, leaving a kind of cyst behind; and there was neither inflammation nor condensation around these bodies. One of the bronchial glands enlarged nearly to the size of last joint of thumb; several branches of pulmonary nerves being raised, and somewhat stretched over tumour. This gland presented the usual black appearance externally; interior, a mass of light yellowish substance of cheesy consistence, similar in nature, but softer than contents of pulmonary tubercles.

*Abdomen.*—Several red patches, varying in size from a sixpence to a shilling, observed on serous surfaces of small intestine opposite to attachment of mesentery; they marked the situation of internal ulcers, by which the mucous membrane had been destroyed. Corresponding mesenteric glands enlarged and congested.

No. 16.—F., æt. 45. In hospital seven years and nine months.

*Head.*—External vessels quite empty; those of membranes and brain moderately congested; the vessels traversing cerebral substance rather large and full; and about two tablespoonfuls of watery fluid in base of skull, after brain was removed.

*Chest.*—Posterior portion of each lung in congestive stage of pneumonia; it sunk in water, though so soft, as to be easily broken down by finger; upon surface of pleura, covering these portions, a slight and incomplete film of fibrine;

mucous membrane of trachea and bronchi congested, but not thickened.

No. 17.—F., æt. 50. In hospital twenty-six years.

*Head.*—External vessels empty, those of interior highly congested, and of dura mater injected to minutest ramifications; copious flow of blood from surface of membrane, at all points, when skull-cap was detached; vessels of cerebral substance large, numerous, and filled with blood throughout; slight serous infiltration of pia mater on convexities of cerebral hemispheres; and two or three tablespoonfuls of watery fluid in basis of skull, after brain was removed.

*Chest.*—Thyroid gland enlarged, and dark coloured from vascular congestion; on cutting into each lobe, sero-purulent fluid, of light yellow tint, escaped in some quantity. Mucous membrane of pharynx and œsophagus presented a slight dull discoloration from vascular congestion, and tube a little constricted at upper part of chest, without any change of structure. Above this point, membrane was covered by a copious, yellowish white, viscid secretion. Below constriction tube larger than above, and filled with pultaceous food recently swallowed. Cellular texture at back of tube at constricted part, for an inch and a half in length, by one inch in breadth, was thoroughly infiltrated with thick yellow pus, the immediately surrounding textures being healthy.

No. 18.—F., æt. 49. In hospital three months.

*Head.*—Opacity of arachnoid covering cerebral hemispheres; with considerable infiltration of pia mater in same situation. About ℥j of fluid in lateral ventricle.

*Chest.*—Very firm, old adhesions of left lung at two points. Inferior lobe of right, consolidated throughout; being so much hepatized in its posterior half as to sink in water. Right cavity of heart partially filled with coagulum, which extended into trunk and primary branches of pulmonary artery; and venous trunks filled with blood.

No. 19.—M., æt. 77. In hospital three years and one week.

*Head.*—Vessels of brain and membranes remarkably empty. When skull-cap was removed, dura mater loose and fluctuating, owing to infiltration of pia mater; this membrane, where it covered cerebral hemispheres, forming a soft, spongy mass, loaded with serous fluid, not less than half an inch thick at some points. In these situations, cerebral convolutions were proportionally shrunk. Lateral ventricles contained about ʒiij of perfectly limpid fluid. Crura cerebri and cerebelli, and pons Varolii small, but exhibiting no change of structure. Coats of internal carotids, and their primary branches partially thickened and opaque.

*Chest.*—Upper and back part of each lung connected to cavity by firm old adhesions. Substance of both lungs completely consolidated, to a small extent, near apex; the surface being drawn in so as to present a cicatrized appearance of old date.

*Abdomen.*—Firm old adhesions of right lobe of liver to adjacent viscera. Partial contraction of ileum, about middle of its course, rather more than an inch in length; and bounded internally by a circular mark in mucous membrane, at commencement and termination; this mark resembled a cicatrix, but there had been no impediment to transmission of internal contents.

No. 20.—M., æt. 55. In hospital twenty-one years and ten months.

*Head.*—Vessels of brain and membranes empty; sections of medullary substance presented few and very small red points. Cellular tissue of pia mater considerably infiltrated in fissura Sylvii, and neighbouring lateral parts of hemispheres; cerebral convolutions being proportionally shrunk in these situations; lateral ventricles contained about ʒiv of clear fluid; pons Varolii smaller than normal, the difference arising from diminution of transverse fibres; arterial trunks within cranium dilated, and considerably diseased; particularly internal carotids, right vertebral, and whole course of

basilar artery; the last vessel at one part fully as large as the arteria innominata; optic nerves flattened, apparently from pressure of dilated internal carotids. Internal coats of all these vessels generally opaque, thickened, and of yellowish colour. Considerable ossification of basilar artery at one part; and the coats of several smaller arteries opaque and thickened; medullary substance of one hemisphere, to a small extent, of a light yellowish brown tint, having a cavity in its centre less than the circumference of a shilling, with smooth surface. At another point, similar discoloration, with softening, both of cortical and medullary substances.

*Chest.*—Right lung universally adherent to side of cavity by very strong adhesions; posterior third consolidated, and filled with tubercles, which had not suppurated; bronchus and ramifications greatly congested, presenting a uniform dull discoloration. A few very small tubercles scattered through posterior part of left lung.

No. 21.—F., æt. 58. In hospital ten months.

*Head.*—Serous infiltration of pia mater to moderate extent. About ℥j of limpid fluid in each lateral ventricle; a few very small patches of opaque thickening in coats of arterial trunks, at base of brain.

*Chest.*—Partial old adhesions of small extent in each side of thorax; submucous tissue at back of tongue, on anterior aspect of epiglottis, and along aryteno-epiglottidean folds of membrane, especially on left side, thoroughly infiltrated with thick yellow pus; œdematous thickening of mucous membrane in these situations, with small patches of dark redness, particularly on epiglottis; membrane ulcerated at three points, along the interval between tongue and epiglottis, to small extent, so as to expose subjacent yellow tissue; inflammatory congestion, with slight serous infiltration of thyroid gland.

No. 22.—M., æt. 32. In hospital eighteen days.

*Head.*—Cellular texture of pia mater considerably infiltrated over whole surface of cerebrum; and much fluid

remaining in base of skull after the brain was removed. About ℥j of clear fluid in each lateral ventricle.

*Chest.*—Nearly whole inferior lobe of right lung, and posterior portion of superior in congestive stage of inflammation; dark coloured from loaded state of vessels, as solid as liver, but breaking down under pressure. A similar affection of left lung to small extent, and firmly adherent.

No. 23.—F., æt. 56. In hospital six months and three weeks.

*Head.*—Slight infiltration of pia mater, a few drachms of clear fluid in lateral ventricles; vessels of brain and membranes not turgid; but numerous orifices of divided vessels visible on section of cerebral substance.

*Chest.*—Right lung connected to thorax by close general adhesions of old date.

*Abdomen.*—Uterus scarcely enlarged beyond virgin size, rather softer than normal state, and in so high vascular congestion, that it was throughout of a deep livid tint; vessels of uterine appendages all turgid. On surface of peritoneum, where it passes from uterus to rectum, two recent deposits of soft yellow fibrine, each covering a space about equal in circumference to half-a-crown, and but slightly adherent.

No. 24.—F., æt. 25. In hospital eight months.

*Head.*—External vessels, and those of dura mater quite empty; acute inflammation of arachnoid, over whole surface of cerebrum, cerebellum, and medulla oblongata. These parts, and internal surface of dura mater, plentifully smeared with thickish, yellow, puriform fluid; minute vessels of pia mater ingested, and membrane generally of a pink tint over cerebral convolutions; partial infiltrations of pus in pia mater, particularly in each side of great fissure; mostly on surface, but descending, at a few points, for a short way between cerebral convolutions; thickening of arachnoid, and purulent infiltration under it at middle of base of brain; thickening and yellow colour of velum interpositum,

extending to edges of choroid plexuses. Fluid in lateral ventricles not much beyond natural quantity, but turbid and yellowish.

*Chest.*—Partial old adhesions of both lungs; tubercles of considerable size, irregularly scattered through each; and a large cavern in upper and back part of right lung.

*Abdomen.*—Uterus presented an irregular bulging at middle of its upper and posterior aspect; coats here changed in structure, through their entire thickness, to an extent about equal to circumference of a shilling; changed part of the firmness of scirrhus, pale, but possessing few, if any, blood-vessels. N.B. Thickening and induration of mucous membrane at back of tongue in epiglottis and glottis; all apparently of long standing.

No. 25.—M., æt. 41. In hospital nine years and six months.

*Head.*—Slight partial thickening and opacity of arachnoid on cerebral hemispheres, and at basis of brain; considerable serous infiltration of pia mater, about ʒj of clear fluid in each ventricle; orifices of divided vessels, in sections of cerebrum, large and numerous; the remains of a cerebral hemorrhage in right hemisphere of brain. Cerebral substance of brown colour for nearly two inches, measuring from before backwards. This discoloration occupied part of corpus striatum; the ventricular surface of which was, however, entire. In centre of brown part a small cavity existed with smooth sides; discoloured portion rather firmer than natural texture of brain, and extending about one sixth of an inch in depth all round central cavity; coats of arterial trunks, at base of brain, partially thickened and opaque.

*Chest.*—Right lung consolidated throughout; so much so, in greater part of its extent, as to sink in water; purulent infiltration through nearly whole of lung, substance breaking down under moderate pressure; recent agglutination of base of lung to diaphragm, and of neighbouring surface to thoracic parietes, with slight effusion of soft

yellow fibrine. Left lung diseased in similar manner, but to less extent; about two thirds being consolidated, and in a more or less advanced state of purulent infiltration; left ventricle of heart thick and strong.

*Abdomen.*—Kidneys at least three or four times usual size, and beset through their whole substance with cysts of various sizes, containing a thicker or thinner turbid fluid loaded with cholesterine. N.B. Stricture of urethra, and coats of urinary bladder thickened and indurated; right testicle enlarged, of pyriform shape; swelling firm, but fluctuating, and found to be a hydrocele; tunica vaginalis dense and hard, but not thick; containing fluid of consistence of thin gruel, dirty brown, with a large proportion of cholesterine.

No. 26.—F., æt. 62. In hospital fifteen years and three months.

*Head.*—Vessels of brain and membranes turgid; and orifices on cut surfaces of cerebral substance, large and very numerous; considerable infiltration of pia mater. A few drachms of clear fluid in each lateral ventricle, and a large quantity in base of skull after brain was removed. Several convolutions of cerebral hemispheres shrunk, intervals being filled up by infiltrated pia mater.

*Chest.*—Lungs connected to parietes, universally, by close old adhesions; purulent infiltration of mucous membrane at base of tongue and fauces, with partial exposure of pus by ulceration.

*Abdomen.*—General recent inflammation of peritoneum, with agglutination of intestinal convolutions; partial effusions of soft yellow fibrine, and of sero-purulent fluid in small quantity. The inflammation seemed to have begun in pelvis, where it was most intense, and appeared to have extended thence over the abdomen. No breach of surface, nor any other local cause discovered for the inflammation above described.

No. 27.—M., æt. 37. In hospital five years and six months.

*Head.*—Considerable serous infiltration of pia mater, with partial diminution of convolutions of hemispheres. About ℥j of fluid in lateral ventricles; much water in base of skull, after brain was removed; vascular orifices on cut surfaces of cerebral substance, large and numerous.

*Chest.*—Partial old adhesions of lungs; both beset throughout with small tubercles in larger or smaller quantity: a few small cavities filled with purulent matter: right lung consolidated almost entirely.

No. 28.—F., æt. 70. In hospital five days.

*Head.*—Neck and head livid from general fulness of blood-vessels, and much blood ran out on opening cranium; all the vessels of head, both external and internal, in the highest state of ingestion; cellular texture of pia mater infiltrated to great extent, so as to form a soft mass of gelatinous appearance, at least one third of an inch in thickness over convolutions of cerebral hemispheres; vessels in substance of brain, large, and filled with blood; a few drachms of limpid fluid in each lateral ventricle.

*Chest.*—General adhesion of right lung of old date; partial adhesions of left; heart rather flabby.

No. 29.—M., æt. 56. In hospital 28 years.

*Head.*—External vessels quite empty, and internal containing but little blood; skull-cap thick and heavy; thickening and opacity of arachnoid over cerebral hemispheres; considerable infiltration of pia mater; some drachms of fluid in each lateral ventricle, and a considerable quantity in base of cranium after removal of brain.

*Chest.*—Left lung filled throughout with tubercles, among which several small caverns containing pus. This lung also connected to parietes, through its whole extent, by adhesions principally recent; right lung partially tuberculated and adherent.

No. 30.—F., æt. 51. In hospital two months.

*Head.*—Very slight effusion into arachnoid cavity, con-

sisting partly of an extremely soft filmy substance, in very small quantity, with a few dots of blood on surface of right hemisphere; less than ℥j of fluid in lateral ventricles; this and arachnoid effusion deeply tinged with bile.

*Chest.*—About two pints of fluid in right pleura; left lung generally adherent; a few ounces of fluid in pericardium.

*Abdomen.*—About a pint of fluid in abdomen, of deep bilious tinge; the effusion into pleura and pericardium, being of same character; liver of a dull, dirty, grayish colour throughout; surface of hepatic duct and ductus communis, presenting the usual yellow tinge of hepatic bile; gall-bladder contracted to the size of little finger, and containing two concretions; a third completely filling and closing the cystic duct.

No. 31.—F., æt. 50. In hospital eighteen years and six months.

*Head.*—Slight infiltration of pia mater; vessels in cerebral substance rather larger, and apparently more numerous than in normal state.

*Chest.*—Extensive tubercular disease, with numerous purulent cavities in both lungs.

No. 32.—F., æt. 18. In hospital sixteen days.

*Head.*—External vessels completely empty; internal of brain and membranes in highest state of congestion; adhesion of dura mater to skull-cap particularly strong; vessels of dura mater, pia mater, and cerebral substance injected with blood, to minutest ramifications; a few drachms of watery fluid, slightly tinged with blood, ran out of arachnoid cavity, on cutting round the dura mater; pia mater greatly infiltrated throughout; a few drachms of fluid in lateral ventricles, and much remaining in base of skull, after brain was removed; substance, both of cerebrum and cerebellum, particularly soft.

*Chest.*—Firm old adhesion, of limited extent, at upper and back part of right lung; here, substance of viscus hard,

for about diameter of a shilling, and contained a little knot of dry, hard, whitish substance, apparently earthy.

No. 33.—M., æt. 57. In hospital three years and eight months.

*Head.*—External vessels quite empty; those of dura mater turgid. Recent coagulum of blood, about a dessert-spoonful spread thinly over middle lobe of left cerebral hemisphere. Large coagulum, also recently effused, amounting to some ounces, occupied nearly whole posterior lobe, and portion of middle lobe, extending to surface of lateral ventricle, which was ecchymosed, but not actually penetrated; about ℥j of slightly reddened fluid in lateral ventricles; medullary substance, in front of extravasation, of semifluid consistence; recent coagulum, the size of a small walnut, at posterior extremity of right hemisphere; in right middle lobe, large excavation, with irregular broken surface, from an effusion of longer date; cerebral substance, on surface of cavity, of a dirty brown, and same discoloration extending into neighbouring texture; coagulum, in parts, of brownish hue, but not filling cavity; convolutions of hemispheres completely flattened, and no moisture on surface of arachnoid.

*Chest.*—General old adhesions of right lung; great hypertrophy of left ventricle of heart, sides being twice the ordinary thickness, compact, firm, and strongly coloured.

No. 34.—F., æt. 33. In hospital three weeks.

*Head.*—Vessels of brain and membranes everywhere turgid. Slight infiltration of pia mater on cerebral hemispheres.

*Chest.*—Left lung universally and strongly adherent to cavity; tuberculated and consolidated throughout, so that it sunk in water. External surface of right lung covered by a closely adhering adventitious membrane, of tolerably firm texture, which could, however, be torn off, leaving pleura pulmonalis entire; slight old adhesions at one part, and in cavity of pleura at least a pint of fluid, somewhat turbid, but without any mixture of fibrine.

No. 35.—M., æt. 42. In hospital seven years and six months.

*Head.*—External vessels entirely empty; those of brain and membranes turgid; dura mater and cerebral hemispheres in closest contact; convolutions of latter being completely flattened; lateral ventricles greatly enlarged and distended; each cavity containing about ℥iij of slightly turbid fluid. Posterior portion of fornix about an inch in extent, irregularly torn, but not completely through; the edges presenting loose shreds floating in fluid, having all the appearances of recent laceration.

*Chest.*—Both lungs greatly diseased, with partial consolidation of substance; irregular deposit of tubercles throughout, and a few small purulent excavations; left lung so firmly and universally adherent, that it could not be detached; right lung also adhered by its whole surface, but adhesion partly more recent.

*Abdomen.*—Peritoneum extensively tuberculated throughout entire extent, both of parietal and visceral portions, and although not visibly altered in structure, in intervals of tubercles, of a dingy colour. Tubercles varied in size from a pin's head to half an inch in diameter; largest on peritoneum of parietes, and the various folds connected with viscera; smallest on intestines; figure irregular, flattened, dirtyish white, with dark margins, approaching to black; on parietes near liver, and in lesser omentum, some considerable masses, size of walnuts, and of the same substance as tubercles. These consisted of a white cheesy matter, apparently inorganic, and similar to deposits frequently met with in scrofulous absorbent glands. Close and general accretion of opposed surfaces of liver, diaphragm, stomach, duodenum, and colon.

No. 36.—M., æt. 62. In hospital thirty-one years and two months.

*Head.*—Vessels of brain rather empty; considerable serous infiltration of pia mater; and more than ℥j of limpid fluid in each lateral ventricle.

*Chest.*—Right lung universally and closely adherent, and beset, in great part of its substance, with tubercles, among which were some purulent excavations; left lung had a few slight adhesions.

No. 37.—M., æt. 38. In hospital one year and five months.

*Head.*—Arachnoid opaque, and of milky white colour; considerable serous effusion in pia mater covering hemispheres, and at base of brain. About ℥ss of clear serum in each lateral ventricle. No true soft commissure; a thin layer of gray matter, below level of iter ad quartum ventriculum, united lower margins of optic thalami. Upon removal of fornix, whole floor of third ventricle, with opening of infundibulum, became visible; substance of brain white and bloodless.

*Chest.*—Opposed surfaces of pleura united by old adhesions; left lung broken up by infiltration and softening of tuberculous matter; right lung of deep purple colour; towards posterior and lower part numerous patches of bluish black colour, caused by extravasation of blood into pulmonary substance.

No. 38.—F., æt. 59. In hospital one month.

*Head.*—Skull-cap thick; arachnoid transparent; pia mater full of blood; its layers separated by a large quantity of reddish serum. Numerous red points on cut surface of brain.

*Chest.*—Old adhesions of both pleura. Tuberculous matter deposited in upper lobes of both lungs, in small quantity.

*Abdomen.*—Small fleshy growth attached to posterior wall of uterus; ovaries, hard and shrunk.

No. 39.—F., æt. 81. In hospital twenty-nine years and one month.

*Head.*—Skull-cap of preternatural thickness; in frontal and occipital regions it measured three quarters of an inch; bone very vascular, and of less compact structure than natural; vessels of dura mater turgid; pia mater considerably

infiltrated; somewhat increased quantity of fluid in ventricles; vessels in cerebral substance larger than normal.

*Chest.*—Right lung universally and closely adherent.

*Abdomen.*—Liver of dull colour, irregular on surface, and slightly indurated; dropsical effusion in cavity.

No. 40.—M., æt. 26. In hospital one year and six months.

*Head.*—Very slight infiltration of pia mater on cerebral hemispheres; considerable quantity of fluid in and about velum; also in base of skull, after brain was removed.

*Chest.*—Left lung collapsed, and pleura distended with air, which escaped when cavity was opened (pneumo-thorax); surface of lung covered by a thin layer of fibrine, and pleura contained a few ounces of sero-purulent effusion. Lung extensively tuberculated, with several purulent excavations; one being of considerable extent at upper and back part, where lung adhered firmly. Extensive tubercular infiltration of right lung, and posterior portion very dense and solid.

No. 41.—M., æt. 84. In hospital thirty-one years and three months.

*Head.*—External vessels perfectly empty, those within only moderately full. Dura mater adhered so firmly to bone, that great force was required to detach skull-cap; serous infiltration of pia mater, both in cerebral hemispheres and about velum; lateral ventricles large, and contained about ʒij of limpid fluid; brain and cerebellum rather soft.

*Chest.*—Each lung connected to parietes by partial, but very firm and tough, adhesions; left lung consolidated in half or two thirds of its mass, by tubercular deposit, having purulent excavations of various sizes. Similar disease of right lung, but in less degree.

No. 42.—M., æt. 48. In hospital three months.

*Head.*—External vessels empty, those on surface of brain full; considerable infiltration of pia mater; convolutions of hemispheres shrunk, more especially along middle line; and sulci, in three or four situations, three quarters of an

an inch across, being filled with clear colourless fluid, effused into cellular texture of pia mater. Partial opacity of arachnoid in small streaks, and patches scattered irregularly over hemispheres; also slight opacity and thickening about pons Varolii; vessels of cerebral substance throughout considerably enlarged and distended; between one and two ounces of limpid fluid in each lateral ventricle; and much fluid in base of skull after brain was removed. Extensive softening of left hemisphere, beginning in front of posterior lobe, extending through middle and reaching to front of anterior lobe; its principal seat in middle lobe, where it began on level of corpus callosum, and affected whole substance below that point. Medullary substance, at upper part, of a dull pink colour, with numerous small injected vessels; softening began below this structure, and the medullary substance had the consistence of cream in inferior bulge of middle lobe; cream-like portion nearly white; rest of softened substance presented a slight degree of dull yellowish and brownish discoloration; change nearly confined to medullary substance; cortical substance presenting merely a yellowish discoloration of small extent,in two or three places, but without change of consistence.

*Chest.*—Partial old and strong adhesions on each side; and a portion of left lung, at back part, hepatized.

No. 43.—F., æt. 19. In hospital twenty-four days.

*Head.*—All the interior vessels extremely turgid, to minutest visible branches; partial opacity of arachnoid, in minute spots, on convexities and hemispheres; serous infiltration of pia mater.

*Chest.*—A few old adhesions of lungs; an abscess, size of a pullet's egg, and another half as large, containing dark coloured, yet purulent, fluid in small quantity, in upper and back part of left lung; parietes of abscess, and surrounding tissue softened and dark coloured, apparently approaching gangrene; posterior portion of same lung generally in highest state of vascular congestion, loaded with dark blood, and containing very little air. In trachea and branches much offensive fluid similar to contents of abscesses.

*Abdomen.*—Small intestines dark and contracted; mucous membrane of darkest colour from very high state of vascular congestion.

No. 44.—M., æt. 37. In hospital nine years and ten months.

*Head.*—Opaque white spots on arachnoid. (Was a criminal lunatic, and therefore not a fair illustration.)

*Chest.*—Tubercles in upper part of both lungs, also adhesions in several situations; heart larger than natural; cavities dilated; right auriculo-ventricular opening admitting introduction of four fingers; pulmonary artery plugged by firm coagulum which extended into ramifications.

*Abdomen.*—In upper part of jejunum, an abnormal diverticulum, of equal diameter to intestine, and about three inches in length; in jejunum, ileum, and superior portion of colon, numerous ulcers penetrating peritoneal coat, and varying from size of a split pea to a shilling.

No. 45.—F., æt. 69. In hospital eighteen days.

*Head.*—Skull-cap thick and heavy; arachnoid thickened and opaque; pia mater infiltrated by bloody serum; substance of brain vascular, and of pinkish red hue. About ʒj of clear serous fluid in lateral ventricles.

*Chest.*—Apex of right lung adherent to parietes by an old tough band; opposite surfaces of left pleura universally adherent; bronchi filled with frothy mucus; vegetations upon tricuspid valves; semilunar valves of pulmonary artery thickened and puckered.

*Abdomen.*—Kidneys small, and cortical substance shrunk; capsule of spleen thickened and white coloured.

No. 46.—M., æt. 29. In hospital four years and ten months. (Being a criminal lunatic, the same remark applies as to No. 44.)

*Head.*—A few opaque white spots on arachnoid. Infiltration of pia mater, substance of brain firm and bloodless.

*Chest.*—Old adhesions of pleuræ; masses of gray semi-

transparent tubercle, numerous and of various sizes, especially in upper lobes, and several cavities. Sac of pericardium obliterated by old adhesions; right auriculo-ventricular opening dilated.

*Abdomen.*—Considerable quantity of yellow serous fluid in cavity of peritoneum; tubercular matter in mesenteric glands, which were enlarged and in masses along upper border of pancreas, and in mesentery; absorbent glands, similarly diseased, surrounding cæcum, and firmly adherent to back part of cavity; several circular ulcers in ileum and sac of cæcum; epithelial cells of liver distended by oil-globules; mass of tubercular matter occupying substance of pancreas.

No. 47.—F., æt. 81. In hospital fifty-four years.

*Head.*—Considerable quantity of serous fluid effused in pia mater, and amongst convolutions of brain, which were much shrunk and atrophied; cerebral substance pale and firm; lateral ventricles filled with clear serous fluid; yellow deposits in coats of carotid; bony prominences within cranium strongly marked, and in several situations rough or sharp.

*Chest.*—Numerous old adhesions of right pleura; pericardium containing pale yellow-coloured serum in small quantity; mitral valves opaque, thickened, and somewhat puckered.

No. 48.—F., æt. 21. In hospital six days.

*Head.*—All the vessels of brain and membranes loaded with blood; bloody points, on cutting cerebral substance, everywhere large and numerous; slight serous infiltration of pia mater; fifth ventricle enlarged to about three times its natural dimensions, and filled with fluid.

*Chest.*—Upper lobe of left lung very firmly adherent at upper and back part, the whole being occupied by a large excavation filled with thin, reddish brown, and fetid purulent fluid; rest of pulmonary substance consolidated, partly by purulent infiltration, partly by intense vascular congestion and hepatization; pleuræ inflamed and covered with a thin

coating of recent fibrine; old adhesions of right lung, with partial pneumonia in congestive stage, and consolidation.

No. 49.—M., æt. 76. In hospital two months.

*Head.*—Dura mater adhered firmly to skull-cap; arachnoid studded with numerous white spots; pia mater infiltrated; convolutions of brain shrunk; cerebral substance firm and more vascular than natural.

*Chest.*—Sac of right pleura contained eight to nine pints of turbid yellow serum; right lung much compressed, impervious to air, and pushed towards upper part of thorax, to which it was attached by old adhesions; bronchi loaded with secretion; and mucous membrane of a deep red hue.

*Abdomen.*—Liver hard and small.

No. 50.—F., æt. 69. In hospital twenty-nine years.

*Head.*—Cranium irregularly thickened in frontal region; pia mater infiltrated with clear watery fluid. Several convolutions of cerebral hemispheres more or less shrunk, vacuities being filled by infiltrated pia mater. About ℥j of clear fluid in each lateral ventricle. Bloody points large and numerous, wherever cerebral substance was cut through.

*Chest.*—Two or three deposits, osseous or cretaceous, about size of horse-beans, in substance of right lung, also some old and firm adhesions. Left lung very firmly and extensively adherent by posterior surface of upper lobe; collapsed; nearly a pint of fluid in cavity.

*Abdomen.*—Convex surface of liver adherent to diaphragm throughout; concave surface and gall-bladder, to adjacent parts; two large stones in the gall-bladder.

No. 51.—M., æt. 71. In hospital twenty-four years and seven months.

*Head.*—Skull-cap heavy and vascular; dura mater very firmly adherent to bone; arachnoid somewhat opaque; considerable quantity of serous fluid in pia mater, over and between cerebral convolutions, which were much shrunk; about ℥iss of clear watery serum in lateral ventricles.

No. 52.—F., æt. 23. In hospital nine months.

*Head.*—Skull-cap thin and light; arachnoid opaque; effusion of yellowish serum in pia mater; substance of brain firm and white; about ʒss of clear serum in lateral ventricles.

*Chest.*—Soft adhesions of pleura at upper part; both lungs extensively diseased by tubercles. Numerous cavities of various sizes occupied greater part of pulmonary substance.

*Abdomen.*—Tubercles on under surface of liver; considerable quantity of purulent fluid in cavity: peritoneum extensively covered with small granular deposits of lymph; numerous dark-coloured and deep ulcers along whole course of ileum, and upper portion of large intestine, especially about cæcum. Mesenteric glands loaded with tuberculous deposit, and adherent to viscera.

No. 53.—F., æt. 28. In hospital two days.

*Head.*—Vessels of cranial contents generally turgid, and bloody points in cerebral substance conspicuous; great infiltration of pia mater, constituting a covering not less than one third of an inch in thickness, over whole convexities of cerebral hemispheres. Somewhat increased quantity of slightly turbid fluid in lateral ventricles.

*Chest.*—Left ventricle of heart thick and firm; lungs perhaps slightly œdematous.

No. 54.—F., æt. 44. In hospital five months.

*Head.*—Moderate congestion of cerebral vessels; numerous bloody points on cut surface of brain; slight infiltration of pia mater over cerebral hemispheres. About ʒiss of limpid fluid in lateral ventricles.

*Chest.*—Acute inflammation of pericardium of recent date: two or three ounces of sero-purulent effusion in pericardial cavity, of dull red colour, as if from admixture of blood. Surface of entire membrane covered by soft yellow fibrine, in a layer generally thin, but thicker in some parts. Small abscesses in substance of lungs, from size of filberts

to a walnut, containing dull yellowish, or reddish-brown fluid, apparently a mixture of pus and blood, but not offensive in smell. In largest deposit, pulmonary substance had become an ash-coloured slough on surface; four of these collections in left lung, and three in right.

No. 55.—M., æt. 13. In hospital nine weeks.

*Head.*—External vessels quite empty; those of dura mater not fuller than usual. Bloody points on cut surface of cerebral substance numerous and conspicuous. Arachnoid covering hemispheres slightly opaque, of a milky appearance, particularly in intervals of convolutions; lateral ventricles distended and enlarged; fornix raised, so as to bring foramen of Monro into a circular form, making a direct and free opening of communication between both ventricles. Not less than ℥iij of fluid in these cavities.

*Chest.*—Upper and superior lobe of each lung partially tuberculated, corresponding surface being irregularly puckered; vomica on one side of moderate size, lesser vomica and small groups of tubercles in other parts of lungs.

No. 56.—F., æt. 48. In hospital one week.

*Head.*—Vessels of dura mater full of blood; arachnoid thickened and opaque; layers of pia mater separated and infiltrated by an enormous effusion of reddish serum. Convolutions atrophied; about ℥iij of clear serum in lateral ventricles; fifth ventricle also distended with serum; it measured $2\frac{1}{2}$ inches in length, by a quarter of an inch in breadth; left wall adherent to anterior part of left corpus striatum. Foramen of Monro open and oval; congenital fissure of fornix.

*Chest.*—Lungs dark coloured and full of blood; numerous firm black bodies, equal in size to a split pea, upon surface of organs. Microscopical examination proved these bodies to consist of carbon accumulated round minute bronchi and air-cells. Right auriculo-ventricular opening of heart larger than natural; tricuspid valve thickened; free margin of mitral valve much thickened.

No. 57.—F., æt. 63. In hospital three weeks.

*Head.*—External vessels quite empty; very little blood in those of dura mater; vessels in cerebral substance everywhere full; bloody points on cut surfaces large and numerous; medullary substance partially of a very discoloration; slight infiltration of pia mater; about ℥j of faint pink limpid fluid in left ventricle, and rather less in right.

*Chest.*—Partial adhesion of left lung to mediastinum.

*Abdomen.*—Intro-susception of small intestine to extent of three inches, invaginated portion healthy, and withdrawn easily; vessels of ileum congested; peritoneal covering of liver partially thickened and opaque; change not of recent occurrence; gall-bladder at least twice its ordinary capacity; and filled with bile of usual appearance.

No. 58.—M. In hospital four months and a half.

*Head.*—External vessels quite empty; those of dura mater contained but little blood; bloody points on cut surfaces of cerebral substance everywhere numerous; arachnoid slightly thickened and opaque over whole extent of hemispheres; cellular texture of pia mater infiltrated; about ℥j of fluid in each lateral ventricle.

*Chest.*—Tubercular induration, with purulent excavations, of inferior lobe on each side. Small masses of tubercle disseminated through other lobe; at least one half of each lung impervious to air.

*Abdomen.*—Mesenteric glands diseased, and about twice the usual size; and presented, when cut through, mixture of ordinary structure with reddish-gray, tolerably firm and homogeneous deposit.

No. 59.—M., æt. 47. In hospital one month.

*Head.*—Dura mater adhered so firmly to bone that it was torn into shreds when detached from cranium. Membrane having been partially cut through in sawing skull-cap; much fluid, tinged red with blood, escaped; small quantity of blood, recently coagulated, adhered to dura mater, lining

right superior concavity of occipital bone. From this part very thin, soft, and hardly continuous film of slightly red tint extended over considerable portion of cerebral hemisphere; scarcely adherent to dura mater or surface of hemisphere; similar film, but less extensive, on left side; dura mater adhered firmly to bone, where coagulated blood was found; vessels of brain and membranes turgid; bloody points on cut surfaces of brain numerous; slight partial opacity of arachnoid covering cerebral hemispheres. About ℥j of fluid in lateral ventricles.

No. 60.—M., æt. 39. In hospital two years and fifteen weeks.

*Head.*—Vessels of dura mater turgid; and on cutting through membrane, considerable quantity of reddish fluid escaped; entire internal surface of dura mater lined with a continuous adventitious production of red colour, varying thickness, softish consistence, easily lacerable, adhering externally, with a free and smooth internal surface like serous membrane; thinnest on base of skull and inferior surface of tentorium; thicker over cerebral hemispheres, and thickest on falx, as also towards extremities both of anterior and posterior lobes; thinner part nearly transparent and colourless when stretched out, but of decided red colour when folded together; about thickness of arachnoid at base of brain, separate from pia mater; but in some parts it approached in firmness the latter membrane; thicker portions perfectly opaque, nearly as thick as mucous membrane of bladder, of a deep dark red colour, here and there as dark as coagulated venous blood, and presenting appearance of partial ecchymosis under surface; latter appearance was also observable in some situations where structure was thin; on anterior and outer part of right hemisphere, an irregular cavity, in the adventitious production, not well defined, nor with smooth surface; it also contained some reddish fluid; arachnoid much thickened and completely opaque along edges of great longitudinal fissure of cerebrum; similar change, in slighter degree, extended over whole cerebral

hemispheres; cellular texture of pia mater infiltrated; blood-vessels of cerebrum turgid, particularly in substance. About ℥j of fluid in each lateral ventricle; and much fluid, with bloody discoloration, remained in base of skull after brain was removed.

*Chest.*—Upper part of each lung consolidated by tubercular deposit, with one large and some smaller purulent excavations.

No. 61.—F., æt. 54. In hospital twenty-nine years and eight months.

*Head.*—Skull-cap thick and heavy; slight partial infiltration of pia mater, particularly in two spots where a cerebral convolution had shrunk; its place being supplied by perfectly clear fluid under arachnoid. About ℥j of limpid fluid in each lateral ventricle.

*Chest.*—Linings of bronchial tubes, red, and smeared with puriform secretion.

No. 62.—F. æt. 60. In hospital eleven weeks.

*Head.*—External vessels empty; internal, including those of cerebral substance, turgid; vessels of cranium contained much blood; dura mater adhered very firmly to bone, being torn in shreds when cranium was removed; some quantity of reddish fluid escaped on cutting through dura mater, nearly of watery consistence, mixed with thicker portions, opaque, of light reddish-brown tint, and of the consistence of pus, thicker matter smeared in small quantity over dura mater, at different points; pia mater infiltrated with similar red fluid, causing deep discoloration of membrane in sulci between convolutions; pia mater likewise partially thickened, as if from infiltration of fibrine; arachnoid and pia mater also slightly thickened at base of brain; substance of cerebrum and cerebellum, throughout, softer than usual, breaking down under slightest pressure; an ecchymosed appearance on surface of left middle lobe, more than an inch in length, and half as wide; cerebral substance broken down and mixed with small recent coagula, to depth of nearly an inch,

neighbouring medullary matter presenting light yellow tinge; small portion of clotted blood in corresponding surface of dura mater, with similar portions in two or three other situations: cerebral substance broken down and ecchymosed in same manner, but to smaller extent, towards upper and anterior part of right hemisphere; about five or six ounces of slightly turbid fluid in each lateral ventricle, and much bloody fluid remained in base of skull after brain was removed.

*Chest.*—Concentric hypertrophy of left ventricle of heart.

No. 63.—M., æt. 55. In hospital ten years and five weeks.

*Head.*—External vessels empty. After skull-cap was removed, dura mater tense, and on division of membrane, brain bulged a little over edge of bone, as if previously compressed; surface of arachnoid comparatively free from moisture, and convolutions of cerebrum partially flattened. In substance of left hemisphere, a lacerated cavity with broken and irregular surface, containing at least ℥iij of coagulated blood; cavity principally in middle lobe, but it extended also into posterior and anterior. It came close to exterior wall of ventricle, in which no breach of surface could be detected, although fluid in cavity appeared deeply tinged with blood; while that in right ventricle was similarly discoloured in a less degree; upper surface of this cavity of same level with roof of ventricle; it contained a firm, recent, black coagulum, with a little thickish fluid blood of same colour. Substance of brain turgid, of a reddish-brown, to extent of half an inch or three quarters all round; colour deep close to excavation, and gradually shaded off; for another half inch, medullary substance of light yellow tint.

*Chest.*—Slight effusion of fibrine on lower edge of upper lobe of right lung, and incipient consolidation of neighbouring pulmonary substance. General old adhesions of left lung; concentric hypertrophy of left ventricle of heart; muscular substance being firm and compact.

No. 64.—M., æt. 28. In hospital five months and one week.

*Head.*—Cranium thick, dense, and very heavy; parietal bone on left side, midway between orbit and coronal suture, presented an irregularity of surface, about extent of a crown-piece; had central depression with superficial furrows leading thereto. Internal table exhibited corresponding appearances with greater roughness; central portion quite thin, so as to transmit light. Dura mater adhered very firmly in this situation, thickened, and heavy, small fibrous growth filling up excavation of bone; opposite to this part of bone dura mater adhered firmly to cerebral arachnoid, in extent of nearly two inches square; arachnoid partially opaque over cerebral hemispheres; pia mater infiltrated. About ʒvj of slightly turbid fluid in each lateral ventricle.

*Chest.*—Left ventricle of heart considerably enlarged; parietes being firm, thick, and of florid red colour.

*Abdomen.*—External covering of liver partially and irregularly thickened and opaque, at upper and back part of right lobe. About an inch below surface in this situation, a hard morbid deposit, about size of a small apple; substance dense, firm, of yellow colour, and apparently inorganic; immediately surrounding portion of liver, about half an inch in extent, was hard and pale, contrasting strongly with deep brownish-red, of hepatic substance.

No. 65.—F., æt. 62. In hospital twenty-two years and eleven months.

*Head.*—Skull-cap extremely thin and light; arachnoid dry; pia mater over entire surface of cerebrum and cerebellum, infiltrated by yellowish-green, purulent fluid. At base of cranium, a thin layer of lymph, forming an adventitious and continuous membrane, effused over basilar process and spine of occipital bone; contiguous margins of cerebral substance, at fissure of Sylvius, adherent; three of four superficial extravasations of blood, largest being in the course of olfactory nerves, between thickened pia mater and

gray vesicular cerebral matter; substance of brain vascular. About ʒiij of turbid, yellowish, sero-purulent fluid in ventricles. Same morbid appearances noticed upon spinal cord, a short distance down cervical region, and vertebral canal full of sero-purulent fluid.

*Chest.*—Old adhesions over greater part of both pleuræ; left lung much compressed, in consequence of malformation of thorax.

No. 66.—M., æt. 26. In hospital five weeks.

*Head.*—Blood-vessels of brain and membranes turgid, and slight infiltration of pia mater.

*Chest.*—Left lung universally and closely adherent to parietes. General tuberculization, with purulent excavations of various dimensions; entire pulmonary substance consolidated; a few small tubercles scattered through right lung, which was slightly consolidated.

No. 67.—M., æt. 67. In hospital one year and eleven months.

*Head.*—Considerable infiltration of pia mater over whole cerebral hemispheres; partial opacity of arachnoid on each side of great fissure; lateral ventricles considerably enlarged, and contained clear fluid, but were not distended, although each could have held between two and three ounces; foramen of Monro formed a direct round opening betwixt two cavities.

*Chest.*—Close and general adhesions of right lung to cavity, of old date; large portion of pleura covering upper lobe of left lung, thickened, white, and opaque; pleura covering lower and back part of lung, and corresponding lining of cavity inflamed, with slight effusion of yellow fibrine; pulmonary substance, at same situation, in congestive stage of inflammation, with a few points of effusion.

According to the preceding statement, the following summary may be given of the pathological changes of structure observed after death, in the heads of the 67 lunatics examined. In 53 cases, effusion of water had taken place in the ventricles; in 53, also, infiltration of the pia mater; in 38, turgidity of the blood-vessels of the brain and membranes; in 30, the arachnoid membrane was thickened and opaque; in 26, the colour of the medullary substance was changed from its natural tint to a claret, red, yellow, brown, reddish-brown, pink, white, or pale tinge; in 18, the brain appeared shrunk, flattened, or swollen; in 15, effusion of blood was noticed within the cranium; in 12, the texture of the brain was altered from its normal consistence to greater firmness, or a softer condition than natural; in 13, bloody points were numerous on the cut surfaces of the medullary substance; in 11, water was effused in the base of the skull, after the brain had been removed. In addition to the diseased appearances now enumerated, other morbid alterations of structure were also noticed in particular patients; such as effusion of pus within the cranium, of which four examples are recorded in the cases now reported, besides various individual changes in the cranial contents different from their normal condition. However, as it would be superfluous again to enumerate the morbid appearances already mentioned, reference should be made to the several cases reported in the above synopsis, in order to ascertain the different forms and varieties.

Notwithstanding the marked diseased alterations frequently observed in the organs of the chest in the lunatics examined pathologically—indeed, nearly the entire number of autopsies now reported exhibited more or less of disease in the contents of that cavity—yet almost half likewise showed morbid changes of structure in the organs of the abdomen. Of the 62 having diseased alterations in the chest, 48 manifested recent or old adhesions; in 25, tubercles existed; in 23, suppuration had actually commenced; in 23, the lungs were consolidated; in 17, lymph was effused into the pleura; in 8, inflammation of the lungs or pleura had supervened;

in 7, the colour of the lungs appeared altered; whilst in 17 cases the heart was found to be diseased in its structure.

Respecting the morbid changes met with in the abdominal viscera of the 30 cases above mentioned, it seems unnecessary further to allude to the morbid phenomena observed than to state, that in 13 of the patients the liver was diseased; in 8, there appeared decided marks of intestinal inflammation; and in 6, tuberculous deposits were noticed in various structures; in 5 cases effusion of lymph, and in 2, of pus, had taken place; in 4, there was alteration or mortification of the intestines; and lastly, in 2 patients the kidneys were diseased.

From the decided and serious character of the morbid alterations of structure met with in the various dissections reported in this communication, it will be at once perceived that the deaths of many of the lunatics evidently arose in consequence of physical disease, especially in the organs of respiration, and also from recent affections of the brain, wholly irrespective of the patient's mental malady. In illustration of the above interesting feature respecting the apparently immediate cause of death, in many of the lunatics treated at Bethlem Hospital, it may be instructive to mention that of the 136 persons who have died in that establishment during the last six years, including all classes of insane patients, whether in the curable, incurable, or criminal departments, 28, or 20·58 per cent. of the deaths actually arose from pulmonary consumption, whilst 16, or 11·76 per cent. were produced by apoplexy. Disease of the heart occasioned death in 8 individuals; in several dropsy was the cause; gangrene of the lungs in others, as also ulcerations of the intestines; besides various other diseased alterations of structure in the abdominal viscera, the organs of the chest and the brain; similar to those by which patients, not insane, often fall victims. In fact, many of the 136 individuals now mentioned, died from organic affections, analogous to the maladies usually observed in ordinary medical practice.

Another point of some interest seems worthy of a passing remark, seeing it is illustrated by several of the

cases contained in the above synopsis of dissections; namely, the long period of time, during which some of the patients continued insane. For instance, No. 50, a female, was 29 years a lunatic. Another female, No. 61, was 29 years and 8 months mad; and another female, No. 2, was 42 years in the same condition. But the most remarkable instance of long-continued lunacy, without any intermission, is that of No. 47, likewise a female, who had been an inmate of Bethlem Hospital for not less than 54 consecutive years. This unfortunate and afflicted human being, deprived of reason, shut out from all worldly enjoyment by her continuous residence in the same lunatic asylum for upwards of half a century, and having farther a weak physical constitution, nevertheless attained an advanced age. Thus showing how long insanity may continue, even when occasioned by marked physical disease in the head; as in this instance, where the brain was found shrunk and atrophied; cerebral substance pale and firm; lateral ventricles filled with fluid, and yellow deposits in the coats of the carotids; besides several rough or sharp bony prominences within the cranium. Nevertheless, this patient, so long insane, and whose case seems sufficiently interesting to be again alluded to in detail, instead of being ultimately carried off by any recent bodily disease, actually died from syncope, according to the report of her attending physician. Amongst male lunatics, fewer instances of long-continued insanity are recorded than amongst the female lunatics. However, two men, Nos. 36 and 41, had been so afflicted, in both instances, upwards of 30 years; whilst another male lunatic, No. 4, had for 42 years continuously resided in the asylum. These cases at least prove that male, but especially female, lunatics may live for a long period, notwithstanding the existence of their incurable mental malady.

Before concluding the observations which I have now had the honour of bringing under the notice of the Fellows of the Royal Medical and Chirurgical Society, I would only further yet briefly remark, that taking into account the one hundred and eight dissections of lunatic patients

reported in my two previous papers published in the Transactions, along with the sixty-seven additional cases contained in the present communication, the following may be subjoined as an epitome of the principal diseased alterations of structure met with in the one hundred and seventy-five autopsies, now or heretofore recorded. In 145 cases, the pia mater was infiltrated. In 127, there was turgidity of the blood-vessels. In 120, fluid was effused in the ventricles. In 62, the arachnoid coat was thickened and opaque. In 45, the colour of the brain was altered from its natural tint. In 32, bloody points were noticed on the cut surfaces of the medullary substance; and in 32 cases, blood was found effused within the cranium; besides various other morbid alterations of structure already enumerated. From these data it therefore unequivocally appears, that the diseased changes which pathologists may generally expect to find on examining the heads of lunatics, in a great majority of dissections, will be—1st, infiltration of the pia mater; 2d, turgidity of the blood-vessels of the brain and membranes; and, 3dly, effusion of fluid in the ventricles.

Having already occupied so much space with these remarks, I will only further observe, that the chief object of every practitioner being to cure disease, I think an advance towards accomplishing this desirable end is greatly promoted by investigating the causes and the ultimate results of any malady, whether bodily or mental; more especially when the various deductions enunciated are based upon an extensive series of data, whether statistical or otherwise. This task I have endeavoured to perform, to the best of my power, in the present communication. How far the attempt may have proved successful, others can alone decide. At all events, I hope, the facts now detailed, and the different pathological examinations now reported, will be considered in some degree interesting, if not useful, both to the practical physician and to students of medical psychology.

# A CASE OF HEMIPLEGIA,

## ASSOCIATED WITH GREAT HYPERTROPHY OF THE HEART, AND TERMINATING BY RUPTURE OF THE AORTA, PRODUCING DISSECTING ANEURISM.

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Communicated by FREDERICK LE GROS CLARK, Esq.

Received May 24th.—Read June 26th, 1849.

John Spinks, a shoemaker, æt. 52, was admitted into St. Thomas's Hospital, under the care of Dr. Bennett, on the 27th of February, 1849. He is a thick-set, somewhat muscular, well-nourished man, of rather above the middle stature. He states that he has always been temperate, and that, notwithstanding his sedentary employment, he has not suffered from constipation, or any particular dyspeptic symptoms, but has always enjoyed very good health till within the last few months. For five or six months past, however, he has experienced more or less palpitation of his heart, but this appears to have been the only symptom of cardiac disease that has been noticed.

For three months past, he has had more or less of headache, dimness of vision, and vertigo. Fourteen days ago, he awoke in the night with loss of speech and power of voluntary motions of the right side. He had, however, manifested some hesitancy of speech before retiring to bed. His intelligence was not affected, and the sensation of the right side but slightly impaired.

He has now, February 28th, considerable difficulty in speaking, and his articulation is very indistinct. There is no manifest impairment of his intellect, and, although he has not entirely recovered either the sensation or power of motion of the right side, he walks without much dragging

of the leg, and complains only of some numbness of the fingers. The tongue, which is strongly protruded to the right side, is slightly furred and coated. There is no drawing of the mouth when at rest, but, on directing him forcibly to retract the mouth, it is evident that he has less power on the right than on the left side. He has equal power of winking with both eyes. His appetite is good; the bowels rather sluggish. He complains of giddiness and uncomfortable feeling in the head, but has no headache.

On exertion he has a certain amount of dyspnœa, and occasionally a catching of the breath, of a spasmodic character. There is greatly increased impulse of the heart, with extended dulness on percussion over the cardiac region. A slight diastolic bruit is heard below, and a little to the *right of the nipple*, and there only. Pulse 84, rather full and vibrating. Throughout the chest generally the respiratory and percussion-sounds are natural. There is no œdema of the extremities, nor does the countenance indicate any obstruction to the pulmonary circulation.

He was ordered a jalap and calomel purge to take immediately, and to be cupped over the cardiac region to ℥viij; and afterwards a pill, containing blue pill and rhubarb, every night, and a mixture three times a day, consisting of equal parts of infusion of valerian and gentian, with a saline aperient. Milk diet.

*March* 5th.—He has felt more comfortable since the cupping, having had less vertigo and less of the general sense of uneasiness about the head, which, however, he still says has not amounted to pain. His articulation is not improved; the tongue is still furred, and he has some thirst; bowels open. The last day or two he has had a good deal of palpitation, with a sense of anxiety about the præcordia. To omit the mixture, and take two grains of pil. hydrarg. with three of Dover's powder, night and morning.

*March* 8th.—His mouth is slightly affected by the mercury, and he complains much of palpitation of the heart. The urine, which is abundant, was tested for albumen, but none detected.

The pill to be taken at night only. To have tinct. digitalis, ♏ x, and tinct. hyoscyami ♏ xv, in infusion of valerian, three times a day.

*March* 12th.—Has less palpitation, and his head feels more comfortable, but he complains of a constant sense of craving. Pulse 92; bowels open; paralytic symptoms much the same.

*March* 15th.—Palpitation and impulse of the heart somewhat diminished, but he has much more giddiness, and apparently from this cause, mainly, he has more difficulty in walking; his mouth is still tender; the bowels are kept well open with house medicine: Applic. emp. lyttæ nuchæ.

*March* 29th.—Since the last report he has improved, both in his own feelings and in his powers of articulation and of walking; the gums are still tender, his pulse is quick, and he perspires much, especially about the head; he complains much of the sense of sinking at the pit of the stomach, and of craving for food, and is anxious to be allowed a more generous diet. To have a little fish for dinner.

*April* 9th.—He continued apparently to improve till yesterday, when he was seized with a paroxysm of palpitation and dyspnœa, his speech became much more inarticulate, and paralysis, both of sensation and motion, of the right side was increased. Having laid hold of a vessel of hot water, without being aware of the temperature, he has burnt his hand. Ten leeches to be applied to the temples, to be followed to-morrow morning by a blister to the nucha. To have a jalap and calomel purge.

*April* 12th.—His speech is very indistinct, but he thinks that he is again recovering power and feeling in his right hand and arm. The tongue is white and furred, and the pulse quick; and there is some dyspnœa.

*April* 16th.—His speech is again improving considerably, and he has manifestly more sensation and power of motion of the right side. He thinks that the accidental burn, which has been followed by suppuration, has been of use to the paralytic limb.

*April* 19th.—All the paralytic symptoms are much the

same; the tongue still furred, and the pulse quick; the skin cool and moist, and the bowels acting well.

*April* 21st.—He is to-day exceedingly feeble, his speech quite inarticulate, his pulse more frequent, and of much less power; his breathing is quick and hurried; his intelligence is unimpaired and he intimates that he feels very faint and exhausted; his countenance is somewhat more flushed than it has been, and expresses considerable anxiety. There are no fresh paralytic symptoms. Stimuli and an antispasmodic mixture were ordered to be taken as he might require them; mustard cataplasms to the soles of the feet.

*April* 24th.—He continued in much the same state till this morning, when he suddenly uttered a cry, and made signs for the sister. On her arrival at his bedside he was unconscious, breathed twice or thrice, and expired not more than three or four minutes from the time of his cry for assistance.

*Examination* of the body 24 hours post mortem.

Little or no emaciation.

*Head.*—The arachnoid, slightly opaque, was raised over both hemispheres by clear serous effusion. The vessels of the pia mater were congested, but the substance of the brain generally was pale and rather soft. In the middle of the left corpus striatum there was a large apoplectic clot, of an uniform dark black colour, and apparently of very recent formation. The cerebral substance, for some distance round the clot, was in a softened pulpy condition, in colour presenting various shades of reddish-brown.

In the centre of the left half of the pons Varolii was a small clot of the size of a horse-bean, similar in appearance to the one in the corpus striatum, and apparently of about the same date; the surrounding cerebral substance was also in a like state of white pulpy softening, but without any of the intervening rusty discoloration. Towards the centre of the right half of the pons, the cerebral substance was also in a state of white softening. All the arteries at the base of the brain, and the smaller branches given off from them, were loaded with atheromatous deposit.

*Chest.*—The left pleural cavity contained between three

and four pints of recently extravasated blood, a considerable portion of which was coagulated. On seeking carefully for the source of the hemorrhage, there was discovered a laceration in the costal pleura, just below the head of the ninth rib. The aperture, about half an inch in length, was surrounded by a large clot of extravasated blood; on tracing this extravasation it was found to extend posteriorly from the apex to the base of the chest, and laterally half way to the cartilages of the ribs. The cellular tissue in the posterior mediastinum was throughout infiltrated with recently coagulated blood, by which the pleura on either side was raised. On laying open the aorta, in situ, there was discovered a nearly transverse rupture, three quarters of an inch in length, situated immediately beneath the origin of the subclavian artery, i. e. at the extreme upper part of the descending aorta. This rupture was directly through all the coats of the artery; the edges of the aperture were somewhat ragged, and traversed a patch of atheroma; the lining membrane adjoining was friable and easily separable, but was not (till the vessel had been handled) actually detached from the coat beneath.

Above the point of rupture there was no separation of the coats of the artery; but, from this point downwards, blood was effused between the coats of the vessel, splitting it up as far as the iliacs. In the upper portion of the aorta the splitting was through the substance of the middle coat, the annular fibres of which were distinctly discernible, and in almost equal abundance, on the outer and inner side. As the separation of the coats of the vessel was traced farther and farther downwards, there was less of the middle coat on the outside, till on arriving at the bifurcation of the aorta, the effused blood was inclosed between the middle, and the outer, coat of the vessel. The quantity of blood effused between the coats of the artery varied at different points, but nowhere occupied more than three parts of the circumference of the vessel.

Throughout its entire course the aorta was thickly studded with atheromatous deposit, varying much in extent and

thickness; in some places augmenting very considerably the whole thickness of the middle coat, which was everywhere somewhat hypertrophied. The atheromatous patches began immediately above the aortic valves, and were scattered in small quantity along the ascending and transverse portions of the arch as far as the origin of the left carotid. From this point the artery was thickly studded throughout, as far as it and its branches were examined.

The pericardium was healthy. The heart was enormously enlarged, and weighed one pound six ounces and a half (avoirdupois). The principal enlargement was of the left ventricle, the muscular parietes of which measured one inch and one eighth, except towards the apex, where the thickness rapidly diminished, and at the point measured less than a quarter of an inch. The cavity of the ventricle was greatly enlarged. The parietes of the right ventricle were not three lines thick, but its capacity was increased to an extent corresponding with the left ventricle. The capacity of the auricles was not proportionately increased. The mitral and aortic valves presented the slightest degree possible of thickening and opacity, associated with a few minute spots of atheromatous deposit; with these exceptions all the valves were healthy, as was also the endocardial membrane throughout. The coronary arteries appeared to be perfectly healthy, there being some patches of atheroma around their orifices, but none in the arteries themselves.

The left lung was compressed by the blood effused into the pleural cavity, but was healthy in structure, as was also the right lung. In the right pleural cavity there was a considerable quantity of straw-coloured serum. The pleura was healthy.

*Abdomen.* The liver was enlarged, but appeared to be healthy in structure.

The kidneys were rather larger than natural, their surface smooth and regular, and the capsule readily separable; on section, they presented a pale, mottled aspect. In the right there was a single simple serous cyst, half an inch in diameter, and in the left several smaller ones. The right kidney was examined by Mr. Simon, who found some of the tubules

impacted with old epithelial scales, the renal artery irregularly dilated, its contractile coat brittle, and its lining membrane thickened by irregular fibrinous deposits.

The spleen, stomach, pancreas, and intestines were healthy; but about the middle of the ileum there was a portion of one of the strong bristles, used by shoemakers, so firmly impacted at one extremity, into the mucous membrane, as not to be removable by any ordinary force.

I have been induced to submit the foregoing case to the consideration of the Fellows of the Royal Medical and Chirurgical Society, believing that the chain of morbid phenomena which it discloses, will, as a whole, be considered as presenting many points of interest both to the pathologist and practical physician, rather than because any one of the several important lesions is particularly rare, or that I have any novel hypothesis to offer in their explanation.

Without attempting to discuss the precise nature of that change in the arterial system which leads to the formation of atheromatous deposits, if, as I am disposed to view it, we consider it as the origin of all the subsequent structural changes, both in the heart and brain, as well as the more immediate cause of the fatal termination, the foregoing case affords a remarkable example of the vast importance of what must doubtless be considered as a constitutional cause that can produce such effects. There is no evidence that this man ever suffered from any arthritic complaint, nor did the heart present any indications of having ever been the seat of any acute inflammatory action. The endocardial membrane and the several valves were, with the trivial exception mentioned, remarkably healthy; unless, therefore, we look on the hypertrophied state of the heart as a mere coincident and an example of idiopathic hypertrophy, we are constrained to view it as a consequence of that very extensive disease of the arterial system, by which the elastic reaction of the more important vessels to the heart's impulse must have been materially impaired, if not destroyed, and thus a serious obstacle presented to the circulation of the blood,

calling for increased exertion on the part of the central organ. But there is reason for thinking that an additional cause for increased action on the part of the heart may have existed. Although from an ordinary inspection of the aortic valves they do not present any evidence of insufficiency, yet it seems probable that the column of blood in the aorta would, in consequence of its diminished elasticity, fall back, after each systole of the ventricle, with such increased force as to produce some separation of the edges of the valves, and thus some regurgitation. The existence of a slight diastolic bruit during life would appear to favour this view, which is further strengthened by a reference to the state of the ostium aortæ, which is not increased in size proportionably to the heart or the descending portion of the aorta. (The orifice of the aorta measures an inch in diameter.)

If we refer the changes in the cerebral structure, and the consequent hemorrhage and paralytic symptoms to impaired nutrition and obstructed circulation resulting from the diseased condition of the cerebral arteries, one cannot fail to be struck with the important contrast presented in this respect by the heart, the arteries of which were healthy, and whose nutrition was so greatly augmented.

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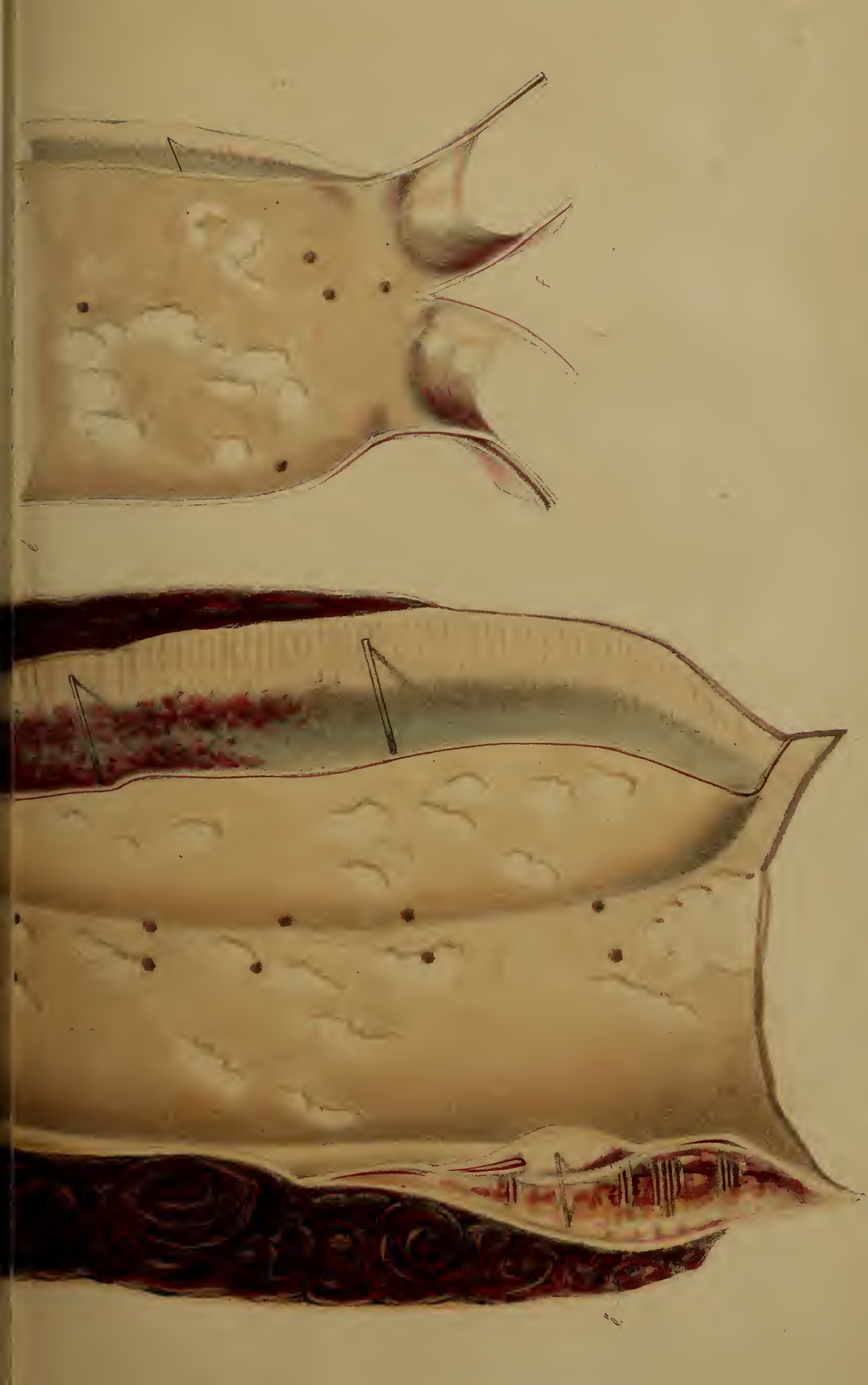
*Postscript, Aug.* 6, 1849. Some discussion took place after the reading of the above case as to the cause of the diastolic bruit, and it was suggested that it was produced by the depression or aneurismal dilatation, which it was thought existed at the point where the rupture occurred. I have, however, carefully examined the preparation again, without being able to satisfy myself that there was anything more than a slight depression at the spot occupied by the atheromatous patch through which the rupture recurred. And my colleague, Mr. Adams, who made the post-mortem inspection, and examined the preparation when recent with considerable care, is convinced that there was nothing which could be called an aneurismal dilatation at the point in question.

a
b
c
d
e



## DESCRIPTION OF PLATE III.

A. Orifice of the arteria innominata.
B. Orifice of the left carotid.
C. Orifice of the left subclavian.
D. Spot at which the rupture took place, and through which a probe passes between the split middle coat of the aorta.
E E′ E″. The middle coat split, showing the circular fibres, in some places stretching across from one to the other side of the artery, with the remains of the interposed coagulated blood.
F. The lower portion of the aorta, cut off, to show that the splitting of the middle coat extended to the iliacs.

CASE OF

# POPLITEAL ANEURISM,

IN WHICH THE

## FEMORAL ARTERY WAS TIED AFTER THE SAC HAD BURST.

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Communicated by SIR BENJAMIN C. BRODIE, Bart.

Received May 8th.—Read June 12th, 1849.

The accompanying case of popliteal aneurism occurred in the Hospital of the Grenadier Guards, under the immediate charge of Mr. Huthwaite, Surgeon of the 3d battalion of that regiment, in conjunction with whom I daily visited the patient. It derives its interest chiefly as one of the few cases terminating favorably, in which an operation was performed after the rupture of the sac, and consequent extravasation; also of the success of that operation after the failure of compression. It has always been a matter of question whether amputation should be performed directly after the rupture of the sac, or whether the artery should be taken up and an attempt be made to save the limb.

I therefore simply offer this case to the Society as one to be added to the list already published, in order to form some data to guide us in our practice.

Private John Maiden, Grenadier Guards, aged 37, by trade a shoemaker, of spare make but well proportioned; height five feet ten inches, habitually healthy.

March 17th, 1848. Relieved off sentry and walked to hospital reporting he had pain and swelling of the left knee-joint, which he attributed to rheumatism. On a previous guard six days prior to admission, he first felt pain in the joint, and also became aware of the existence of the popliteal

tumour; but obtaining relief by the application of a stimulating embrocation, he disregarded it at the time. On examination, the popliteal space was found to be filled with a firm pulsating tumour, of the form and size of a large orange, the nature of which could not be doubted. The superficial veins below the knee were somewhat turgid, and the limb to the same extent was affected in a slight degree with serous infiltration. There was no febrile disorder present, and we felt assured after careful investigation that no cardiac disease existed.

Such being the features of the case, it offered, as we deemed, a suitable one to effect a cure by the method of compression on the femoral artery. With but little delay the process was commenced; preparatory to which, however, he was bled to the amount of twenty ounces, and placed upon a spare diet for a few days.

On the 21st, the fourth day after admission (in the interim the tumour not having enlarged), the pad of an Italian tourniquet was applied over the artery a little above where it enters the tendinous canal. The means employed were adequate to extinguish the pulsation of the tumour, but the pressure applied to effect this could not be borne continuously, and we were obliged to rest our only hope upon partially checking the flow of blood into the tumour. The immediate consequences of the interrupted circulation in the extremity were increased turgidity of the superficial veins, a trifling degree of fulness of the limb arising from capillary congestion, and, to the feel, augmented temperature; at first the patient was restless, and subsequently experienced several slight paroxysms of febrile disorder, but eventually he was brought to a quiescent state. As the circulation adapted itself to its altered course the tumefaction of the limb nearly disappeared, as also the turgidity of the veins. A slight degree of erythema was produced by the pressure of the pad, which was relieved by changing somewhat the point of resistance. Under this course of treatment the tumour appeared to diminish in volume, to feel more solid, and to lose in part its strong pulsation, and we were sanguine enough to hope for a successful

issue to our persevering efforts; however, on the morning of the 30th of March, the eighth day of the application of the pressure, whilst the patient was motionless, he was suddenly seized with acute pain in the knee, followed by a quick tumefaction of the parts. On examination, the popliteal tumour appeared unchanged, but an additional tumour was found on the inner side of the joint, circumscribed, flattened, and pulsating in a slight degree; it was about the size of twice that of the palm of the hand, with considerable prominence: it was evident that the coats of the aneurism had given way, and allowed blood to be effused. We at once decided to tie the femoral artery, and the operation was performed by Mr. Huthwaite, after a delay of only three hours from the time that the sac burst. The patient was subjected to the influence of chloroform, and the operation carried through its progressive stages with facility and expedition. The parts divided seemingly had not suffered from the long continued pressure. The moment of the application of the ligature, the pulsation of the tumour ceased. The limb again became tumid, and the superficial veins became more turgid, accompanied by augmented heat of the skin. These effects speedily subsided. The effused blood was gradually absorbed, and the aneurismal tumour by degrees diminished. The incised parts united partly by the adhesive process, and partly by that of granulation; the ligature separated on the twenty-sixth day after the operation.

April 9th, 1849. The tumour is now reduced two thirds of its volume, and the man has recovered the perfect use of the limb, and is doing all his duties as a soldier.

Note. August 8. Maiden still works at the shoemaker's shop in his barracks, and takes the lighter guards when it comes to his turn, as he still walks rather lame. After much exercise he suffers from cramp in the calf of the leg, and swelling of the ankle. The tumour in the ham has diminished since April, and is now about the size of half a walnut; the circulation in the leg appears good.

CASE OF

# CHRONIC HICCUP AND VOMITING:

## DISCOVERY OF OXALIC ACID IN THE BLOOD.

By ALFRED BARING GARROD, M.D.,
ASSISTANT-PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL.

Communicated by Dr. WILLIAMS.

Received June 18th.—Read June 26th, 1849.

During the Session 1847-8, I had the honour of bringing before the Society the results of some researches I had made on the condition of the blood in health, also in gout, rheumatism, and Bright's disease. I then demonstrated the existence of uric acid in that fluid, a substance which I believe had never before been found in it, and showed the variations in amount which it undergoes under different circumstances. I have now the pleasure of making known the existence of another acid in blood never before detected, although in many cases sought for. It is with the view of announcing this fact that I again trespass on the Society; the short time which has elapsed since the discovery, being my excuse for not having as yet determined the laws which regulate the amount of the acid found, &c.

I will very shortly relate the case of the patient in whose blood these peculiarities were first observed, as perhaps the results of the examination of this fluid may throw some light on certain symptoms exhibited during life.

A man, Joseph Robson, æt. 65, a piano-forte maker, subject in his employment to the vicissitudes of the weather, and partaking rather freely of alcoholic fluids, first came under my notice as an out-patient at University College

Hospital, in February 1849. He then complained of cough, and œdema of the face and extremities; the urine when first examined was not albuminous, but at the next visit was found to be highly charged with albumen. A small amount of blood was taken from the loins by cupping, the examination of which will be afterwards detailed. In about a fortnight from this time, his symptoms becoming more urgent, he was made an in-patient under Dr. Williams.

*Condition when admitted,* March 3d. Considerable œdema of face and extremities, together with ascites; constant hiccup, attended with eructation of either food or a clear watery fluid; no renal or abdominal tenderness; nor pain of any kind, but a drowsy and confused sensation; bowels very much confined; cough troublesome; dullness on percussion, and deficient breath-sound in the lower part of the left back; urine strongly albuminous, of a cherry red colour from the presence of blood.

March 8th. With the hiccup a dark-red coloured fluid has been eructated containing blood-corpuscles and (according to the clinical clerk) pus; tongue red at tip and edges, but brown-furred in the centre, tenderness was detected in the left lumbar region; the same matters were also eructated next day, but more of a coffee-ground colour. Pulse 56, respirations 28, per minute.

On the 15th the ascites had increased, the albumen in the urine diminished. On the 16th a dark-coloured fluid with a coagulum of blood was vomited; the urine was then alkaline, albuminous, dark-coloured, containing blood-corpuscles and crystals of the triple phosphate.

On the 26th the urine contained casts of tubes, urates, and crystals of uric acid; it was also albuminous.

April 5th. Ascites much increased; urine contains only a trace of albumen.

On the 10th the urine was not albuminous; sp. gr. 1015.

18th. Complains of difficulty in swallowing food.

29th. Eructation of coffee-ground matter; is sinking.

On the retirement of Dr. Williams from the duties at the hospital, he again came under my care.

May 3d. Vomiting continues, bowels constipated, thirst excessive, for allaying which much cold water is taken, but it is very soon rejected by the stomach.

4th. Takes no food; urine large in quantity, contains crystals of uric acid, but no albumen.

6th. At 10 p.m. became senseless, and died at 6 a.m., on the 7th.

*Post-mortem.* The only morbid appearances worthy of notice, were as follows: A few ounces of fluid in the left pleural sac. In the peritoneal cavity about 330 ounces of fluid, which was transparent, and of a greenish-yellow colour. The kidneys had a few cysts on their surface, were coarse in texture, and when minutely examined, their surfaces were found studded with innumerable white points, which appearance was found to arise from the tubes in the cortical portion being filled with a white plaster-like matter (urate of soda). This phenomenon, in a much smaller degree, is sometimes seen in the kidneys of gouty persons. The whole tract of the intestinal canal appeared healthy, as also the other organs of the body.

*Examination of the blood taken from the vessels of the head.* —No coagulation took place when the fluid was allowed to stand, but the globules subsided, and the serum possessed the following characters. It was alkaline, had a sp. gravity 1013·25, at 60° Fah.

Alcoholic solution of 1000 grains examined for urea, gave of nitrate of urea =4·25 grains.

The watery solution was then treated for the purpose of ascertaining the quantity of uric acid, but, with the greatest care, only traces could be discovered; in its place, however, a heavy whitish deposit was observed, which, by microscopic and other tests,* was found to be composed of an immense

* As the crystals were not in quantities sufficient to be collected apart from the fluid, it may be well to mention the microscopic and chemical tests employed to ascertain their nature.

*Microscopic appearances.* Most of the crystals had the form of the flattened octohedron, and, when made to roll in the fluid, presented the

number of crystals of oxalate of lime, most of them having the ordinary octohedral form, but some few having a spheroidal and even what has been termed dumb-bell appearance, exactly resembling those found in urinary deposits.

*Method of examining blood to obtain crystals of oxalate of lime.*—The serum of the blood should first be dried in a water-bath, and boiled with alcohol to remove matters soluble in that menstruum; a watery solution must then be made, which is afterwards evaporated to the consistence of a very thin syrup, and acetic acid added, so as strongly to acidulate the fluid; if any oxalic acid is present in the serum, crystals of oxalate of lime will form after the fluid has been allowed to rest for some hours. Uric acid also if present will be found to become crystallized at the same time, but forms a much heavier deposit than the oxalate of lime, and can readily be separated.

It may be observed that there is some difficulty in chemically explaining the process given above for obtaining oxalate of lime from blood, as this salt is insoluble in water, but it must be remembered that a watery solution of the serum, prepared according to the above directions, always contains a certain amount of a protein-compound, doubtless holding in solution phosphate of lime; such being the case, the following *may* perhaps be the explanation of the phenomenon.

A soluble oxalate may be contained in the watery solution of the blood without being able to decompose the lime existing in it as a phosphate, but on concentrating the fluid, and acidulating with acetic acid, the lime-salt becomes

three different forms depicted in plates of urinary deposits of oxalate of lime; some, as mentioned above, exhibiting dumb-bell-like appearances, also shown in the same plates.

*Chemical reactions.* The deposit was found to be unaffected by *water*, solutions of ammonia, weak potash ley, or acetic acid; but were readily dissolved by hydrochloric and nitric acids.

I may remark, that the crystals have been examined, not only by myself, but by others fully competent to judge of their nature.

separated from the protein body (which is precipitated), and is then decomposed by the oxalate with the formation and precipitation of the insoluble oxalate of lime.

*Examination of the blood taken from the loins of the same patient about seven weeks before death.*—Clot large and firm.

Serum, sp. gravity 1021·8 at 50° Fah.

1000 grains of serum gave, of nitrate of urea, 0·05 gr., and of uric acid, 0·025 gr.

A few octohedral crystals were discovered mixed with the crystals of uric acid, but the amount was small compared with that found in the blood after death.

Since the above observations were made I have examined other specimens of blood for the purpose of ascertaining whether octohedral crystals could be procured, and although I have never observed the crystals in quantities at all equal to those found in Robson's blood, yet I have succeeded in demonstrating their presence, several times, for example, in some cases of gout where there existed considerable inflammatory action. In such blood uric acid has always existed in considerable quantities, whereas in Robson's case in which we might have expected to find uric acid in excess, the blood exhibited scarcely a trace of this body; the oxalates appearing to have replaced the urates.

It appears to me that the discovery of oxalic acid in the blood is of considerable interest and importance; and although, at the present time, I am unwilling to draw any conclusions, the cases in which it has been found having been so few in number,—not more than five in all, yet I regard it as indicating, in the first place, that this acid in cases of oxaluria is probably formed in the blood itself, and not from any change in the urine after its excretion from the kidneys; and secondly, that a close relation exists between the uric-acid and the oxalic-acid diathesis; since the oxalic acid appears either along with uric acid, or where uric acid would have been expected to be present. The latter inference is strengthened by an analysis I have recently made of the blood of the turkey, of which 610 grains of the serum gave no

indications of uric acid, and, after most careful search, no trace of octohedral crystals.

It would be interesting in cases of poisoning with oxalic acid to examine the blood by the method above alluded to, although the mere presence of this acid cannot now be looked upon as a proof that such acid has been administered.

As I am pursuing the investigation of the subject I will not at present allude to any further points, but content myself with little more than the mere announcement of the occasional presence of oxalic acid in the blood of the human subject. How far any of the symptoms exhibited by the patient, whose case is above detailed, depended on the peculiar condition found in the blood, I will not venture to say.

## NOTE BY THE EDITOR.

After the publication of Mr. Paget's "Account of a dislocation, in consequence of disease, of the first and second cervical vertebræ," in the last volume of the Transactions, the following history of the patient was sent to the author by Dr. Joseph Williamson, of Aberdeen. The preparation was recognised by Dr. Williamson as having been taken from a patient whom he examined in company with Dr. Moir. It had been accidentally mislaid among a number of bones collected from a grave-yard and other places.

He was a boy 15 years old, and the first indications of disease of the spinal cord were observed eighteen months before his death. At that time, he suffered loss of power in the left arm and leg, and this loss gradually extended to the right side. Six months after the beginning of this affection he was seen by Dr. Moir, who found him complaining of pain at the occiput and left side of the head, and detected an unusual projection of the cervical vertebræ. Leeches and issues were immediately had recourse to, and with so much advantage, that in six months he was able to walk out. He was going on favorably, when he was one day struck on the back of the neck by a boy who was passing him in the street. From that time the paralytic symptoms began to return, and he soon lost all power over both the upper and the lower limbs. Sensation continued for some time later, and the limbs were subject to some automatic movements. No impaired or irregular action of the respiratory muscles was at any time observed; nor was the catheter required. The muscles of the face and jaw were not affected; but about fourteen days before his death he lost the power of articulating. Deglutition was effected with difficulty during the last week or ten days of his life, and was at last almost entirely impeded. The senses of vision and hearing were

perfect; and the mental faculties were unimpaired till within a few hours of his death.

Dr. Williamson assisted Dr. Moir in the examination of the body; and, in addition to the characters of the dislocated bones described in the last volume, observed the following appearances.

"The body was greatly emaciated. The veins on the surface of the hemispheres of the brain were considerably distended; the ventricles contained two or three drachms of clear fluid; the fornix, septum lucidum, and other central parts of the brain were of natural firmness; the pineal gland was of several times its natural size; the medulla oblongata was of healthy texture, but the membranes covering a part of it were coated with a pretty thick layer of lymph, which, also, extended over part of the cerebellum; the spinal marrow (in the part of the canal narrowed by the dislocation of the vertebræ) was compressed towards the posterior edge of the vertebral foramen, to such an extent that, towards the left, it could not be more than a line in thickness, nor, towards the right, more than two lines."

# DONATIONS

TO THE

## ROYAL MEDICAL AND CHIRURGICAL SOCIETY,

1848-9.

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*** Those works which have been presented by their respective Authors are distinguished by an Asterisk.

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